ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 9.] [1906.

XLVIII.—A NEW FRUIT FROM URUGUAY.

(*Pouteria suavis*, Hemsl.)

In July of the present year, Kew received from the Editor of 'Il Giardinaggio' (an Italian horticultural journal, published in Turin) leaves, fruit and seeds of a South American tree, asking whether it was known to science. This material was supplemented by a paragraph from 'Il Giardinaggio' of which the following is a translation :—

"Mr. E. Frosio, a horticulturist of Paysandu, Uruguay, in a private letter received by the 'Il Giardinaggio,' sends the following interesting note, which we think our readers will like to see :

"'There is a plant bearing a fruit and having persistent leaves, which is certainly endemic in the islands of the Uruguay River and is so peculiar that nobody has yet been able to classify it. The general appearance of the plant is that of a laurel, with leaves which are green and shining on the upper surface. The fruit is about the size of an apricot, but of the shape of an apple ; it is yellow and scarlet when mature and possesses a perfume so delicate that it is equalled in no other fruit. The seed is like a large hazel-nut, but the edible fleshy part of the fruit is small ; it has, however, an extremely agreeable taste and possesses such a remarkable digestive property that when the aborigines have over-indulged, they eat freely of this before lying down at night and then they sleep 'like a child' and wake up the next morning with a clear head and a wonderful appetite.'"

The leaves of this plant agree exactly with those of a specimen in the Kew Herbarium, collected by Dr. P. G. Lorentz in Concepcion del Uruguay, in 1878, and wrongly named *Lucuma gardneriana*, A. DC. (syn. *Pouteria gardneriana*, Radlk.). *Lucuma gardneriana* was collected between Angrias and Saõ Gonsalvo, in Piauhy, about 1,750 miles north of Concepcion del Uruguay, and Lorentz's specimen is certainly different, though closely allied.

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There is also in the Kew Herbarium a small flowerless branch collected in Uruguay by John Tweedie, of what is apparently the same species. Tweedie sailed up the river Uruguay about the year 1833, and probably botanised in the islands. The following note accompanies the specimen :—" This is called among the natives of the Uruguay *aguya*. It is one of the most splendid evergreen trees I have met with, and the fruit, resembling a golden knob pear, has a finer scent than the pine-apple. The two fruits sent are bad specimens." These fruits have disappeared, but those sent by the Editor of ' Il Giardinaggio ' are pear-shaped.

Pouteria suavis, *Hemsl.* [Sapotaceae] ; species nova ex affinitate *P. gardnerianae*, a qua foliis angustioribus lanceolatis, floribus dimidio minoribus et sepalis subaequalibus interioribus haud truncatis emarginatis differt.

Arbor ramis floriferis rectis graciliusculis appresse-sericeis. *Folia* glabra, in ramorum apicibus conferta, demum coriacea, breviter petiolata, anguste oblonga, oblanceolata vel lanceolata, 4–15 cm. longa, saepius circiter 10 cm. longa, 1–2·5 cm. lata, apice obtusa vel rotundata, basin versus attenuata, supra nitida conspicue venosa. *Flores* circiter 3–4 mm. diametro, infra folia ad foliorum delapsorum axillas fasciculati, numerosi, pedicellis sericeis 3–4 mm. longis. *Sepala* 4, biseriata, 2 omnino interiora, similia, ovata, concava, extus sericea, ciliolata. *Corolla* fere ad medium 4-lobata, lobis rotundatis erectis ciliolatis. *Staminodia* oblonga, ciliolata, corollae lobis alterna iisque dimidio breviora. *Stamina* corollae lobis isomera et iis opposita, inclusa. *Ovarium* villosum, 2-loculare (an semper ?) stylo glabro brevissime exserto. *Fructus* pyriformis, 4–5 cm. longus, medio 2·5–2·75 cm. diametro, glaber, pericarpio carnoso tenui. *Semina* saepius 2, semiovoidea, vel 1, ovoideum, testa crassa, ossea.

Steps have been taken to establish this tree at Bordighera, where seeds have been sown in Mr. Garnier's garden. Under cultivation the fleshy part of the fruit may possibly be so increased as to render it acceptable to a circle outside the aborigines of Uruguay.

W. B. Hemsley.

XLIX.—MARINE ALGAE FROM COREA.

We have to-day a good general knowledge of the land flora of Corea, but of the marine vegetation our knowledge is meagre in the extreme. With the exception of Okamura's list of algae from Fusan (Tokyo Bot. Mag. vol. vi., p. 117) and the records of a few stray algae (mostly floating Sargassums) picked up by naturalists and others, we have no information on the subject.

It is therefore satisfactory to have opportunities of examining specimens freshly collected and dried by residents in the country. During the past year Mrs. H. G. Brand and Mrs. Sydney Wakefield have forwarded four small dried collections from Fusan and Wonsen respectively. An examination of these shows that the coast of Corea is not by any means poor in marine vegetation, and will amply repay the time and trouble spent in collecting. This

is rendered evident by the following notes. Two packets of about 20 species each were sent during 1905 from Wonsen, and, with the exception of two species, none of the plants in the two packets were the same. In supplies from Fusan only three species were found which were included in the Wonsen list. Okamura's list above referred to is found to be again very different. The marked dissimilarity in these collections shows therefore that there is a considerable variety in species, and that before an adequate idea of the marine vegetation of the country as a whole can be formed, a much larger supply of material is necessary, not only from various localities, but collected at different seasons of the year. In some cases the material sent was insufficient for identification, and in not a few instances the generic names only could be given. The omission of these from the list, and also of certain critical species, will account for the number of names being somewhat smaller than might be expected.

The algae received from Corea resemble, as one would expect, those of Japan—the only eastern country of which the marine flora is well known. Besides including some of the most interesting Japanese species, the packets sent contained several plants which have not hitherto been recorded from Japan, and others which are entirely new.

The recording of several critical species of which no authentic specimens exist in this country, and as to which further information is desirable, is for the present postponed.

Codium mucronatum, *J. Ag.*, var. **californicum**, *J. Ag.;* De Toni Syll. Alg. vol. i., p. 495.

Wonsen, Feb. 1905, *Wakefield.*

The Corean specimens, like those known from Japan, resemble the Californian variety of *Codium mucronatum* rather than the Australian.

DISTRIBUTION. Var. *tasmanicum*, J. Ag. Australia, Tasmania.
Var. *californicum*, J. Ag. California, Sitka, Japan.

Bryopsis plumosa, *Ag.;* De Toni Syll. Alg. vol. i., p. 431.

Fusan, Jan. 1905, *Brand.*

DISTRIBUTION. Cosmopolitan.

Sargassum Horneri, *Ag.;* De Toni Syll. Alg. vol. iii., p. 20.

Fusan, Jan. 1905, *Brand.*

A very distinct *Sargassum*, and one not readily confused with other species.

DISTRIBUTION. Japan, Corean Strait.

Sargassum tortile, *Ag.;* De Toni Syll. Alg. vol. iii., p. 23.

Wonsen, Jan. 1905, *Wakefield.*

Plants agree well with the original specimens from Nagasaki in Herb. Turner, at Kew : Turner, Hist. Fuc. vol. ii., p. 88, tab. 104, fig. b.

DISTRIBUTION. Japan.

Cystophyllum Thunbergii, *J. Ag.;* De Toni Syll. Alg. vol. iii., p. 157.

Wonsen, Feb. 1905, *Wakefield.*

DISTRIBUTION. China, Japan.

Cutleria cylindrica, *Okam.;* Illust. of the Mar. Alg. of Japan, vol. i., Tokyo, 1902, plate 28.

Fusan, Jan. 1905, *Brand.*

This very interesting plant, fully described and figured by Okamura, bears in its general appearance a strong resemblance to *Stilophora rhizoides*, J. Ag. The reproductive organs are, however, those of the *Cutleria* type.

The striking difference between the present plant and the two well-known species of *Cutleria* is the possession of cylindrical shoots showing radial structure; this has the effect of making it appear a very distinct plant and one almost worthy of generic rank. The filamentous tissue of the axis is also a point of considerable importance. Dr. Okamura has had, however, an opportunity of examining living material, and he considers it a *Cutleria* with radial symmetry. He was unable to observe the escape of the female gametes, but presumably these are similar to those of *C. multifida.* The asexual (Aglaozonial) stage is not yet known, and it will be of much interest to see how this compares with that met with in the other species of *Cutleria.*

DISTRIBUTION. Japan.

Gelidium latifolium, *Bornet;* De Toni Syll. Alg., vol. iv., p. 150.

Wonsen, Oct. 1905, *Wakefield.*

Tetrasporic examples were sent.

DISTRIBUTION. N Atlantic, Mediterranean.

Gelidium australe, *J. Ag.;* De Toni Syll. Alg. vol. iv., p. 153.

Wonsen, Oct. 1905, *Wakefield.*

The specimens sent were of medium size bearing either tetraspores or cystocarps; they agree well with Harvey's Australian plants. Hitherto only known from Australia.

DISTRIBUTION. Australia.

Gigartina tenella, *Harv.;* De Toni Syll. Alg. vol. iv., p. 201.

Wonsen, Oct. 1905, *Wakefield.*

Agrees very closely with Okamura's Algae Japonicae Exsiccatae No. 9.

DISTRIBUTION. Japan.

Gymnogongrus japonicus, *Suhr.;* De Toni Syll. Alg. vol. iv., p. 248.

Wonsen, Oct. 1905, *Wakefield.*

The Corean specimens resemble Suringar's figure, Alg. Jap. t. 24A, but being somewhat less tufted they are also not unlike *G. divaricatus*, Holmes. Mr. Holmes has allowed me to examine

his original specimens, and the Wonsen plants are found to differ from the latter in the forking being less divaricate and in the absence of the dense proliferations from the branches.

DISTRIBUTION. China, Japan.

Ahnfeltia plicata, *Fr.;* De Toni Syll. Alg. vol. iv., p. 254.

Wonsen, Oct. 1905, *Wakefield.*

DISTRIBUTION. N. Atlantic, N. Pacific, Greenland, Kerguelen's Land, Falkland Islands.

Sterrocolax decipiens, *Schmitz;* De Toni Syll. Alg. vol. iv., p. 260.

Wonsen, Oct. 1905, *Wakefield.*

A number of small specimens present on *Ahnfeltia.*

DISTRIBUTION. Probably to be found wherever its host-plant, *Ahnfeltia plicata*, occurs.

Gracilaria corticata, *J. Ag.;* De Toni Syll. Alg. vol. iv., p. 448.

Fusan, Jan. 1905, *Brand;* Wonsen, Oct. 1905, *Wakefield.*

Fine fruiting plants with cystocarps were received. The species would appear to be common in both localities; there is no record of its having yet been found in Japan.

DISTRIBUTION. Indian Ocean, Red Sea.

Plocamium coccineum, *Lyngb.*, var. **uncinatum,** *J. Ag.;* De Toni Syll. Alg. vol. iv., p. 591.

Fusan, Jan. 1905, *Brand.*

The Corean specimens agree very closely with this variety, which is found in the Mediterranean.

DISTRIBUTION. *P. coccineum* cosmopolitan, var. *uncinatum*, J. Ag.; N. Atlantic, Mediterranean.

Plocamium nobile, *J. Ag.;* De Toni Syll. Alg. vol. iv., p. 593.

Fusan, Jan. 1905, *Brand.*

DISTRIBUTION. Cape of Good Hope.

Laurencia paniculata, *J. Ag.;* De Toni Syll. Alg. vol. iv., p. 788.

Wonsen, Feb. 1905, *Wakefield.*

DISTRIBUTION. N. Atlantic, Mediterranean, Japan.

Laurencia obtusa, *Lamour.*, var. **rigidula,** *Grunow;* De Toni Syll. Alg. vol. iv., p. 793.

Wonsen, Feb. 1905, *Wakefield.*

The compact, sturdy little plant received is very distinct in appearance from the common forms of *L. obtusa.* It agrees, however, in its main points with the description of Grunow's Fijian variety *rigidula.* The characters at present employed in classifying Laurencias are so unsatisfactory that one is reluctant to add more forms or varieties to the list, which is already of excessive length.

DISTRIBUTION. *L. obtusa*, Cosmopolitan: var. *rigidula*, Grun., Fiji.

Laurencia pinnatifida, *Lamour.;* De Toni Syll. Alg. vol. iv., p. 798.

Fusan, Jan. 1905, *Brand.*

A thin, loosely-branched form.

DISTRIBUTION. General throughout N. Atlantic and N. Pacific. (The varieties reported from the Southern Hemisphere are probably distinct species.)

Symphiocladia gracilis, *Falkenb.;* De Toni Syll. Alg. vol. iv., p. 990.

Wonsen, Feb. and Oct. 1905, *Wakefield.*

Several fronds of this plant were received in both the Wonsen gatherings. Though at present only known from Japan and China it is apparently common in those countries, having been recorded from numerous localities.

DISTRIBUTION. China, Japan.

Dasya collabens, *Hook. and Harv.*; De Toni Syll. Alg. vol. iv., p. 1208.

Fusan, Jan, 1905, *Brand.*

The Corean specimens are sterile, but in vegetative characters they agree in all respects with Lyall's New Zealand specimens.

DISTRIBUTION. New Zealand.

Ceramium tenuissimum, *J. Ag.;* De Toni Syll. Alg. vol. iv., p. 1450.

Chemulpo, Oct. 1904, *Brand.*

Several tufts of tetraspore-bearing plants were received.

DISTRIBUTION. N. Atlantic, N. Pacific, Tasmania.

Ceramium japonicum, *Okam.;* De Toni Syll. Alg. vol. iv., p. 1459.

Fusan, Jan. 1905, *Brand*; Wonsen, Feb. 1905, *Wakefield.*

Okamura described and figured this species in 1896. Though I have not seen an original specimen, there is little doubt that the plant may now be recorded from the above two localities in Corea.

DISTRIBUTION. Japan.

Ceramium hamatum, *Cotton*, sp. nov.

Wonsen, Feb. and Oct. 1905, *Wakefield.*

Videtur *C. rubro*, Ag., affine, a quo tamen ramis uncinatis recedit.

Frons ubique corticata, inferne subsetacea, immerse articulata, irregulariter dichotoma, sursum attenuata; *rami* biformes, quorum alii erecto-patentes, regulariter dichotomi, segmentis terminalibus forcipatis, alii simplices 'incrassati' uncinati. *Color* roseo-purascens. *Fructus* ignotus.

In its uncinate branches this plant resembles *Campylaephora hypneoides*, J. Ag., of which I at first thought it might prove to be a small and slender form. The thick cortical layer and large

internal cells characteristic of that genus are however entirely absent. The structure on the other hand is that of a corticated *Ceramium* to which genus it undoubtedly belongs. From the dried material it appears to be a rather delicate and fragile species, not unlike in general appearance some of the slender forms of *C. rubrum*. Owing to the absence of tetrasporic plants it is impossible to say in which section of the genus it should be placed.

This plant has been twice received from Wonsen, but on both occasions the specimens were sterile. *Campylaephora hypneoides* also, is only known in the sterile state; tetraspores have been recorded as occurring in the swollen branches, but this has not been confirmed, and it certainly is not usually the case.

Ceramium rubrum, *Ag.*; De Toni Syll. Alg. vol. iv., p. 1476.

Wonsen, Feb. and Oct. 1905, *Wakefield.*

Numerous tufts of a form of this cosmopolitan species were found mixed with, or epiphytic upon, the larger algae.

DISTRIBUTION. Cosmopolitan.

Ceramium Boydenii, *Gepp*, Journ. of Bot. vol. xlii., 1904, p. 164, plate 460, fig. 1-3.

Wonsen, Oct. 1905, *Wakefield.*

A most distinct species, described two years ago by Mrs. Gepp, from China and Japan. The Corean plants agree in all general characters and show the tetraspores borne in the same irregularly shaped ramuli. Their whole appearance tends to confirm Mrs. Gepp's suggestion that this species has a creeping habit.

DISTRIBUTION. Japan, China.

Grateloupia divaricata, *Okam.*; De Toni Syll. Alg. vol. iv., p. 1570.

Wonsen, Oct. 1905, *Wakefield.*

As remarked by Okamura this alga is intermediate in form between *G. filicina*, Ag., and *G. dichotoma*, J. Ag., though it would appear to be much more nearly related to the former than the latter. To the typical forms of *G. dichotoma*, such as are found on the S.W. coast of England and in the Mediterranean, it bears little resemblance, the latter plant possessing repeatedly forked branches which are quite devoid of the tetraspore-bearing proliferations that are characteristic of Okamura's plant. *G. dichotoma* is also much smaller and its dichotomy is more regular. Several tropical plants, notably in Mazé's Algae Guaduloupenses, have been referred to varieties of *G. dichotoma* and to these the Japanese plant bears more resemblance, but after careful examination these cannot be regarded as the same species as that described by Agardh.

On the other hand *G. divaricata* shows resemblance in general appearance and size with *G. filicina*, Ag., and also in the position of the tetraspores, but it differs in the more or less frequent forkings of its branches. In the Corean specimens the forkings are at wide intervals, though the apices of all the main branches are bifid. As in Okamura's specimens the tetraspores appear to be confined to the proliferations.

Okamura remarks that this species has only been found on the west side of Japan and not on the Pacific coast.

DISTRIBUTION. Japan.

Prionitis elata, *Okam.;* De Toni Syll. Alg. vol. iv., p. 1590.

Wonsen, Feb, 1905, *Wakefield.*

Several fine specimens were received. Though no fruit was to be found there can be no doubt as to the identity of the plant.

DISTRIBUTION. Japan.

Dumontia simplex, *Cotton*, sp. nov.

Wonsen, Feb. 1905, *Wakefield.*

D. filiformi, Grev., affine, a qua frondibus simplicibus recedit.

Frondes plures a basi parva scutata, simplices spathulato-lineares, versus basin in stipitem filiformem attenuatae, gelatinosae. *Cystocarpia* immersa, minuta, per totam fere superficiem sparsa, carposporis majusculis ; tetrasporangia immersa, sparsa, cruciatim divisa.

In the specimens received, four or five fronds grow from the minute disk, these taper gradually towards the base, till near the disk the frond is filiform. The plants are 10–12 cm. in height and are apparently full-grown, as they are liberally provided with either tetraspores or cystocarps. The broadest part of the frond is 2–3 cm. from the apex and measures about 1 cm. across. The fronds are apparently very much compressed, with a more or less blunt apex. The specimens adhere very strongly to paper.

The internal structure of the frond is filamentous, and shows no divergence from the usual *Dumontia* type. The large tetraspores are densely scattered in the cortical layer throughout the whole of the upper part of the frond. The cystocarps are similar to those of *D. filiformis*, the carpospores being few but of large size, frequently measuring 80 micromillimeters in length.

Of the various species of *Dumontia* which have been described, *D. filiformis*, Grev., is the only one which is satisfactorily known. Many have been referred to other genera. *D. furcata*, Post & Rupr. (North Pacific), and *D. cornuta*, Hook. & Harv. (Antarctic), are still retained in the genus, but their position is doubtful. Both these species, together with *D. filiformis*, differ from *D. simplex* in their branched habit.

The Japanese plant named by Suringar, *Schyzimenia? ligulata* (Alg. Jap., p. 29, tab. xv.), somewhat resembles *D. simplex*, but differs in frequently being branched. Schmitz (Nuovo Notarisia, 1894, p. 634), however, examined the original material and came to the conclusion that the plant was a *Grateloupia.*

The following additional species from Corea were found unnamed in Sir William Hooker's herbarium now preserved at Kew :—

Pterocladia capillacea, *Bornet;* De Toni Syll. Alg. vol. iv., p. 162.

Port Hamilton, *Wilfred*, No. 728.

Cystocarps not present, but the plant agrees well in general appearance with European specimens of this species.

DISTRIBUTION. Cosmopolitan. (Apparently cosmopolitan, cystocarpic plants being rare, certain identification is in some cases difficult.)

Champia parvula, *J. Ag.*; De Toni Syll. Alg. vol. iv., p. 558.

Port Hamilton, *Wilfred*, No. 728.
Specimens bearing tetraspores.

DISTRIBUTION. N. Atlantic, Mediterranean, Indian Ocean, N. Pacific, Australia.

Gloiopeltis tenax, *J. Ag.*; De Toni Syll. Alg. vol. iv., p. 1533.

Corea, June, 1859, *Wilfred.*

DISTRIBUTION. China, Japan.

Grateloupia filicina, *Ag.*; De Toni Syll. Alg. vol. iv., p. 1563.

Port Hamilton, *Wilfred*, No. 730.

DISTRIBUTION. N. Atlantic, Mediterranean, West Indies, Indian Ocean, Japan.

A. D. COTTON.

L.—BARWOOD.

(*Pterocarpus Soyauxii*, Taub.)

The subject of the red dye-wood or woods, formerly of considerable commercial importance, known commercially as Barwood, is one that has occupied the attention of Kew for a considerable number of years. The matter has not been finally settled, because apparently more than one species is involved, and possibly also in trade circles the name has been at times misapplied. One species, *Pterocarpus Soyauxii*, Taub., has, however, been definitely found to be the source of at least part of the Barwood of commerce. The following note, in which a resumé is given of the knowledge attained, is issued with the double object of making that knowledge available and of inviting the communication of the material required to clear up the points that are still obscure.

Barwood is a product of the West Coast of Africa. According to Holtzapffel (*Descriptive Catalogue of Woods* [1852], p. 73) :—"Two kinds of Barwood are imported from Angola and Gaboon respectively, in split pieces 4 to 5 ft. long, 10 to 12 ins. wide, and 2 to 3 ins. thick. It is used as a red dye-wood ; the wood is rather dark red, but the dye rather pale ; it is also used for violin bows, ramrods, and turning."

Owing to the confusion that existed in the literature bearing on Barwood and on Camwood—another West African dye-wood, which has been satisfactorily identified as *Baphia nitida*, Afz. (*Leguminosae*)—and from the fact that some writers had considered Barwood and Camwood to be derived from the same tree, an application was made by Kew to the Colonial Office in October, 1890, soliciting the co-operation of the Governors of the Gold Coast, Sierra Leone, and Lagos in an effort to settle the question.

As a result of this application a specimen of Barwood from the river Prah, in the district of Chawa, Gold Coast, was received at Kew. The herbarium material which accompanied the specimen was imperfect. It was therefore impossible to determine accurately the tree which had furnished the wood, but from the structure of the latter and the absence of colour it was readily seen that, whatever the species might be, there was no similarity between its wood and that of ordinary commercial Barwood. A sample of Camwood, received at the same time, proved to be really the produce of *Baphia nitida*, Afz.

As regards Lagos, the specimens of Barwood sent to Kew agreed with the "Camwood" of the Gold Coast in having been yielded by *Baphia nitida*. It is therefore clear that at times the one product may be mistaken, in trade circles, for the other.

The Travelling Commissioner of Sierra Leone sent specimens of two woods unaccompanied by herbarium material. One of these was labelled Camwood, *vern.* "Bundoi"; this agrees with specimens in the Museum known to be the wood of *Baphia nitida*, Afz. The other was sent as Konta Wood, *vern.* "Pendeh"; this bears no resemblance to either Barwood or Camwood; it has been determined by Mr. G. F. Scott-Elliott as probably the wood of *Berlinia auriculata*, Benth. (*Leguminosae*). Later, at the request of the Travelling Commissioner, a sample of commercial Barwood was forwarded to Sierra Leone, so that he might study its appearance and characters. The result of the Commissioner's further endeavours to clear up the difficulty is given in a letter from him dated 10th July, 1903 :—"I have for a long time endeavoured to discover a wood which would approximate in colour and other details to the specimen of Barwood submitted to me, but although I have employed an American sawyer to seek for it in the bush, and have shown the specimen to many Chiefs and others, I have not been successful in finding anything which in any way compares with it, nor does the wood appear to be known."

Gaboon is the chief source of Barwood, or Redwood as it is sometimes termed, and there is now hardly room for doubt that, so far as Gaboon is concerned, the species which yields the product is *Pterocarpus Soyauxii*, Taub. (*Leguminosae*). This species has been figured in *Hooker's Icones Plantarum*, vol. xxiv., t. 2369 (1895), and is there described as a tree of the virgin forest, reaching a height of 80–90 ft., and yielding the Barwood or Redwood employed by the natives as a dye. With the description Professor D. Oliver has given the following note :—"Our specimens of *P. Soyauxii*, Taub., were collected by Soyaux and are labelled 'Red- or Barwood of the traders.' The confusion hitherto existing in this case—as in so many parallel instances in which dye-woods or other products of economic value are concerned—between the plant here figured and allied species of *Pterocarpus* and Camwood, *Baphia nitida*, Afz., may now be regarded as satisfactorily cleared up."

An excellent instance of the confusion, to which Professor Oliver alludes, between allied species of *Pterocarpus* is met with in the case of Angola Barwood, as to the botanical origin of which there is still some doubt, though it is probable that it is derived from *Pterocarpus tinctorius*, Welw., a tree 40 to 70 ft. high, which

is described in the *Flora of Tropical Africa* as having a hard red or white wood, and as being widely distributed in Angola. In the *Catalogue of Welwitsch's Plants*, pt. i., p. 277, it is stated that the wood of this species is valuable, of a blood-red colour yielding a red dye, and of much use for carpenters' work. While, however, it appears to be widely employed in Angola as a dye, there is nothing to indicate that it is an article of export.

From personal enquiries recently made in Liverpool, it appears that for the past few years Barwood has been practically unsaleable in this country, and at the present time may be obtained for £2 15*s.* per ton.

With regard to Camwood, this is still imported in small quantities, that known as "Grand Bassa," from Liberia, being considered the best quality; the next in importance comes from Sherboro, Sierra Leone. Inferior varieties are shipped from Gaboon and Old Calabar.

Examples of the products referred to in this note are to be seen at Kew in Museum No. I., cases 36 and 37.

J. M. H.

LI.—NEW ORCHIDS: DECADE 29.

281. **Dendrobium convolutum**, Rolfe; aff. *D. chloroptero*, Reichb. f. et S. Moore, sed floribus majoribus, petalis et labelli lobis lateralibus latioribus distinctum.

Pseudobulbi clavati, circa 22 cm. longi, 14 mm. lati, apice diphylli. *Folia* . . .? *Scapus* gracilis, terminalis, 12–15 cm. longus, 4-florus. *Bracteae* triangulares, acutae, 5 mm. longae. *Pedicelli* glabri, 2·5 cm. longi. *Sepala* glabra, triangulari-ovata, acuta, carinata, 16–18 cm. longa, lateralia in mentum obtusum, 6–8 mm. longum extensum. *Petala* elliptico-oblonga, subacuta, basi angusta, sepalis angustiora. *Labellum* trilobum; lobi laterales late oblongi, obtusi, columnam involventes, apice imbricati; lobus intermedius reniformis, apiculatus, subconduplicatus; discus medius valide bicallosus, pone tricarinatus. *Columna* lata, 2 mm. longa, apice tridentata.

New Guinea.

Flowered with Messrs. Sander & Sons, in November, 1898, and afterwards with Sir Trevor Lawrence, Bart. The sepals and petals are light green, with a few small dark brown markings at the base, the side lobes of the lip are green with dark brown radiating nerves, and the disk and front lobe dark brown, the latter passing into green at the margin.

282. **Coelia densiflora**, *Rolfe;* a *C. Baueriana*, Lindl., racemo densifloro, ovario exalato, et mento evoluto facile distinguenda.

Pseudobulbi ovoidei, apice subattenuati, circa 7 cm. longi, 3 cm. lati. *Folia* lanceolata, acuta, subcoriacea, circa 30 cm. longa, 3 cm. lata. *Scapi* abbreviati, crassi, 6–7 cm. longi, basi vaginis numerosis ovatis acuminatis imbricatis obtecti. *Racemi* ovoidei,

breves, densiflori. *Bracteae* lanceolatae, acuminatae, membranaceae 1·5–2 cm. longae. *Pedicelli* 5–8 mm. longi. *Flores* numerosi, albi, circa 1·3 cm. longi. *Sepalum* posticum lanceolato-oblongum, acutum, concavum, 8–10 mm. longum ; sepala lateralia similia sed basi columnae pedi adnata, mentum oblongum formantia. *Petala* lanceolata-oblonga, acuta, 8–10 mm. longa. *Labellum* 1 cm. longum, basi angustum, subattenuatum, supra medium dilatatum et laeviter trilobum, lobis lateralibus rotundatis, lobo intermedio deltoideo obtuso, disco laevi. *Columna* clavata, 8 mm. longa. *Mentum* oblongum, saccatum, 5 mm. longum.

CENTRAL AMERICA.

Four species of *Coelia* have hitherto been described, all natives of Central America, but a fifth has now flowered at the Royal Botanic Gardens, Glasnevin, Mr. Moore having obtained it from Messrs. John Cowan & Co., without record of its origin. There is, however, a single inflorescence, with sketch of a flower, in Lindley's Herbarium, labelled "Guatemala, Skinner," which is so substantially identical as to leave little doubt that it belongs to the same species, though it has not been utilised in preparing the above description. The flowers of the living plant are white, with a light yellow anther case.

283. **Oncidium Claesii**, *Rolfe ;* affine *O. tenensi*, Reichb. f., sed floribus majoribus, segmentis acutioribus, labelli lobis lateralibus rotundatis nec angulatis differt.

Herba epiphytica, scandens. *Caules* robusti, vaginis membranaceis imbricatis tecti. *Pseudobulbi* 25–30 cm. distantes, oblongi, circa 10 cm. longi, apice diphylli, basi circa 4-phylli. *Folia* ligulata, subacuta (immatura solum vidi). *Scapi* robusti, volubiles, ramosi, 3·5–5·5 m. longi, multiflori. *Bracteae* ovatae, obtusae, valde concavae, 7–10 mm. longae. *Flores* speciosi. *Sepala* unguiculata, elliptico-ovata, apice subtorta et obtusa, paullo undulata, 3·5–4 cm. longa, lateralia subobliqua. *Petala* late unguiculata, ovata, apice falcato-recurva, circa 2·5 cm. longa. *Labellum* trulliforme, apice subattenuatum et obtusum, circa 1·8 cm. longum, 1 cm. latum ; crista carnosa, tuberculata, lamellis tribus in fronte verrucisque pluribus utrinque prope basin instructa. *Columna* clavata, fere 1 cm. longa, alis obsoletis.

COLOMBIA. *Claes.*

A striking species, introduced to cultivation by M. Fl. Claes, Etterbeek, Brussels, who describes the inflorescence as 12 to 18 feet long, entangled and twisted round the branches of a shrub, and bearing numerous large flowers with chocolate-red sepals, the petals and lip deep carmine, tinged with violet, and the crest yellow.

284. **Gomesa scandens**, *Rolfe ;* a species reliquis caule elongato scandente, pseudobulbis distantibus apice monophyllis differt.

Caulis elongatus, scandens, radicans, vaginis imbricatis obtectus. *Pseudobulbi* distantes, elliptico-oblongi vel oblongi, 2·5–4 cm. longi, apice monophylli, basi diphylli. *Folia* patentia, oblonga, subacuta, 6–11 cm. longa, 1–3 cm. lata. *Scapi* axillares, recurvi, 12–22 cm. longi, multiflori. *Bracteae* lineari-lanceolatae, acutae,

4–8 mm. longae. *Sepalum* posticum lanceolatum, acuminatum, circa 8–10 mm. longum; sepala lateralia similia, ad medium connata. *Petala* lanceolata, acuminata, 8–10 mm. longa. *Labellum* recurvum, ovato-lanceolatum, acuminatum, circa 8–10 mm. longum, medio bicristatum, cristis undulatis. *Columna* clavata, 6 mm. longa, alis angustis.

BRAZIL. *Binot;* Environs of Rio de Janeiro, *Glaziou*, 14,303.

Sent to Kew in 1902 by M. Binot, and flowered in the collection in July of the following year. The flowers are greenish-yellow, as in the allied species, from all of which it differs in its scandent habit.

285. **Trigonidium subrepens**, *Rolfe;* affine *T. tenui*, Lodd., pseudobulbis majoribus, foliis latioribus, et sepalis latioribus distinctum.

Rhizoma subrepens, validum. *Pseudobulbi* subdistantes, oblongi, subcompressi, lateribus obscure tricostati, 2·5 cm. longi, monophylli, basi vaginis membranaceis triangulari-ovatis obtecti. *Folia* ligulata, subobtusa, circa 15–17 cm. longa, 1–1·3 cm. lata, subcoriacea. *Scapi* subgraciles, circa 15–17 cm. longi, vaginis numerosis lanceolatis imbricatis obtecti. *Bracteae* lanceolatae, acuminatae, apice carinatae, circa 3 cm. longae. *Sepalum* posticum rhomboideo-oblanceolatum, apice acuminatum et recurvum, circa 2·5 cm. longum; sepala lateralia subobliqua, late elliptica, apice acuminata et recurva, circa 2·5 cm. longa. *Petala* anguste elliptico-oblonga, apice apiculata et recurva, nitida, trinervia, 1 cm. longa. *Labellum* trilobum, 5 mm. longum; lobis lateralibus angustis obtusis erectis; lobo intermedio late oblongo obtuso reflexo; callo oblongo obtuso carnoso. *Columna* oblonga, 4 mm. longa.

HABITAT NOT KNOWN.

A species introduced by Messrs. Sander & Sons, and afterwards by Messrs. Hugh Low & Co., who sent a plant to Kew, where it flowered in June, 1906. The sepals are greenish-yellow, faintly lined with brown, the petals whitish, with three brown lines and a brown blotch at the apex; and the lip greenish-yellow, with brown radiating veins on the side lobes.

286. **Renanthera annamensis**, *Rolfe;* a *R. Imschootiana*, Rolfe, floribus duplo minoribus et sepalis maculatis distincta.

Herba epiphytica, erecta vel subscandens, radicans, 20–30 cm. alta. *Radices* crassi. *Folia* disticha, patentia, circa 2 cm. distantia, oblonga, obtusa et inaequaliter biloba, crasse coriacea, 5–7 cm. longa, 1·5–1·8 cm. lata. *Racemi* interdum ramosi, circa 20–25 cm. longi, multiflori. *Bracteae* ovato-oblongae, obtusae, 2 mm. longae. *Pedicelli* 1 cm. longi. *Sepalum* posticum anguste oblongum, obtusum, concavum, circa 1·3 cm. longum, 3·5 mm. latum; sepala lateralia spathulata, subobtusa, circa 1·8 cm. longa, 6 mm. lata. *Petala* anguste oblonga, obtusa, subconcava, 7 mm. longa, 2 mm. lata. *Labellum* trilobum, 6 mm. longum; lobi laterales erecti, triangulares, acuti, carnosi, 2 mm. longi; lobus intermedius patens, cordato-orbicularis, obtusus, 3·5 mm. latus, basi quinque-callosus; calcar saccatus, oblongus, obtusus, 4 mm. longus. *Columna* lata, 3 mm. longa.

Annam. *Micholitz.*

Introduced by Messrs. Sander & Sons, and flowered at Kew in May, 1906. The ground colour of the flower is yellow, much spotted with crimson on the sepals, spur and base of the petals, while the lobes of the lip and apex of the petals are deep crimson. The column is yellow striped with crimson.

287. **Listrostachys Brownii**, *Rolfe;* inter species affines habitu compacto et racemis densifloris et congestis que distincta.

Caules breves, validi. *Folia* disticha, approximata, oblonga, inaequaliter et obtuse biloba, crasso-coriacea, 4–8 cm. longa, 1·2–1·5 cm. lata. *Racemi* arcuati, secundi, densiflori, 7–8 cm. longi, basi vaginis spathaceis obtecti. *Bracteae* late ovatae, acutae, cucullatae, 8–10 mm. latae. *Pedicelli* breves. "*Flores* albi, fragrantes." *Sepala* recurva, lineari-lanceolata, attenuata, acuta, 10–12 mm. longa. *Petala* sepalis similia. *Labellum* 8–9 mm. longum, basi triangulari-ovatum, cucullatum, apice attenuato-acuminatum et recurvum. *Columna* latissima.

Uganda. Entebbe, at 1170 m. alt., *E. Brown*, 248.

A very distinct species, which Mr. Brown remarks grows in masses, and when in flower is a very showy plant.

288. **Platylepis australis**, *Rolfe;* affinis *P. glandulosae*, Reichb. f., a qua differt sepalis lateralibus latioribus medio subito reflexis, labello basi bigibboso medio constricto.

Rhizoma repens. *Caulis* ascendens, foliosus. *Folia* petiolata, ovata, subacuminata, membranacea, 15–21-nervia, 5–10 cm. longa, 2·5–5 cm. lata; petiolus 3–5 cm. longus, basi in vaginam membranaceam tubulosam dilatatus. *Scapi* erecti, 15–30 cm. longi, vaginis spathaceis distantibus obtecti; racemi oblongi vel elongati, 5–12 cm. longi, multiflori. *Bracteae* ovatae, acutae, glanduloso-pubescentes, 6–12 mm. longae. *Pedicelli* 6 mm. longi, pauce glanduloso-pubescentes. *Sepalum* posticum erectum, oblongum, subobtusum, 6 mm. longum, extus glanduloso-pubescens; lateralia basi subconniventia, medio subito reflexa, oblonga, subobtusa. *Petala* spathulato-linearia, obtusa, cum sepalo postico in galeam angustam cohaerentia. *Labellum* 6 mm. longum, erectum, basi ventricosum, bigibbum, columnae marginibus laeviter adhaerens; limbus elliptico-oblongus, basi constrictus, apice recurvus. *Columna* 5 mm. longa, clavata. *Platylepis glandulosa*, Bolus in Journ. Linn. Soc. xxv. 187, et Ic. Orch. Austr.-Afr. i. t. 11, non Reichb. f.

S. Africa. Natal; in swampy places on the shores of the Bay of Natal, *Wood*, 412; *Sanderson*, 1048; *Saunders; MacOwan & Bolus*, Herb. Norm. Aust.-Afr., 1008.

Hitherto considered identical with the West Tropical African *Platylepis glandulosa*, Reichb. f. It has recently flowered at Kew; the flowers are green with a white upper half to the lip.

289. **Platylepis densiflora**, *Rolfe*; a praecedente sepalis angustioribus, lateralibus medio nec reflexis, petalis angustioribus, et labello medio nec didymo nec constricto differt.

Rhizoma repens. *Caulis* ascendens, foliosus. *Folia* petiolata ovato-oblonga, breviter acuminata, membranacea, 9–17-nervia, 5–11 cm. longa, 2–4 cm. lata; petiolus 3–4 cm. longus, basi in vaginam membranaceam tubulosam dilatatus. *Scapi* erecti, 10 cm. alti, vaginis lanceolatis acuminatis imbricatis obtecti; racemus ovoideus vel oblongus, 2·5–5 cm. longus, densiflorus. *Bracteae* ovatae vel lanceolato-ovatae, acuminatae, glanduloso-pubescentes, 12–18 mm. longae. *Pedicelli* 8 mm. longi, glanduloso-pubescentes. *Sepala* subaequalia, lineari-oblonga, subobtusa, basi conniventia, dein laeviter recurva, 3 mm. longa, extus glanduloso-pubescentia. *Petala* linearia, acuta, cum sepalo postico in galeam angustam subcohaerentia. *Labellum* 6 mm. longum, erectum, basi paullo ventricosum, columnae marginibus laeviter adhaerens; limbus oblongus, apice angustus, valide recurvus; discus bicarinatus. *Columna* clavata, 5 mm. longa.

MADAGASCAR. *Warpur; Baron*, 6550, 6753; Mauritius, summit of the Pouce, in dense woods, *Ayres*.

Flowered at Kew in December, 1901, the plant having been collected by Mr. Warpur. The flowers are light green with a whitish lip. The Mauritian specimen, which is in fruit only, was referred to *Platylepis goodyeroides*, A. Rich., by Spencer Moore (Baker Fl. Maurit. p. 339), but, as Bentham has noted on the sheet, it differs in the shape of the bracts and venation of the leaves. It seems identical with the Madagascar plant.

290. **Cypripedium Wilsoni**, *Rolfe;* affine *C. fasciolato*, Franch., sed flore majore et labello ovoideo nec globoso differt.

Caules 30–40 cm. alti, puberuli, foliosi. *Folia* subsessilia, late elliptica vel orbiculari-elliptica, acuta vel breviter acuminata, plicata, minutissime puberula et ciliolata, 9–16 cm. longa, 4–12 cm. lata. *Flores* maximi, terminales, solitarii. *Sepalum* posticum ovatum, acuminatum, 6 cm. longum; lateralia paullo angustiora, apice breviter fissa. *Petala* anguste oblonga, acuminata, 6–7·5 cm. longa. *Labellum* maximum, late ovoideum, obtusum, 6·5–7 cm. longum, ore crenulato. *Columna* 1 cm. longa; staminodium cordato-ellipticum, concavum, 2 cm. longum. *Capsula* ellipsoidea, glanduloso-pubescens, 3–5 cm. longa.

WESTERN CHINA. Szechuen; Mêng Hu Kāng, a pass between Wantung and Mosimien, on the main road from Tzutati to Tatienlu, in woods, under dense shade, at 2400 m. alt., *E. H. Wilson*, 4581.

The largest-flowered species known. Mr. Wilson describes the sepals and petals as alternately striped with yellow and chocolate, and the lip as pale yellow with chocolate spots.

LII.—SOUTH AMERICAN BEECHES.

The number of species of *Fagus* inhabiting South America is variously estimated, but there are at least four that stand out as quite distinct. They are *F. betuloides*, Mirb., *F. antarctica*, Forst., *F. obliqua*, Mirb., and *F. Dombeyi*, Mirb. Up to quite a recent date only two of them were cultivated in English gardens, viz., *F. betuloides* and *F. antarctica*, the two species which constitute so large a part of the sombre forests of Tierra del

Fuego. Two others—a species and a variety—have, however, been recently added to this interesting group of trees ; they are *Fagus obliqua* and *F. antarctica* var. *uliginosa*. Kew owes their acquisition to Mr. H. J. Elwes, who presented seeds in March, 1902, which he had collected during his travels in Chili and Argentine one or two months previously. Sown in gentle heat they germinated well, especially those of *F. obliqua*, and growing away freely they were planted out in the open ground, where they have now withstood two winters without any protection, and are at present in perfect health. It is, however, too early yet to proclaim them as hardy at Kew, for they have not been subjected to a temperature lower than 19° Fahr. Still, there is little doubt but that they will be perfectly at home in the southern and western counties of England and Ireland, and in the hope of ensuring them a permanent place in the gardens of the British Isles the few surplus specimens will this autumn be distributed to these and similarly mild localities.

F. betuloides is the best known of these South American Beeches in this country, and one of the finest specimens of it in cultivation is in the garden at Pencarrow, Cornwall. This tree is now 39 ft. high with a trunk 4 ft. 3 ins. in girth. The deep lustrous green of its small, prettily crenate, evergreen leaves, and its dense yet graceful habit render it one of the most striking and ornamental of hardy trees. It is now being tried in the open at Kew, but Woking is the nearest locality to London where it is known to have succeeded out-of-doors for any length of time. This is in Mr. Anthony Waterer's nursery. There is also a fine specimen in Mr. B. E. C. Chambers' garden near Haslemere. The species is very abundantly represented in Tierra del Fuego, some of the largest trees having trunks from 4 to 7 ft. in diameter.

F. Dombeyi.—This is an evergreen species bearing some resemblance to *F. betuloides* in foliage. Its leaves are ovate-lanceolate, of hard texture, serrate, and $\frac{1}{2}$ to $\frac{3}{4}$ in. long. There is, however, a form represented in the Kew Herbarium with leaves $1\frac{1}{2}$ ins. long. So far as we are aware, the species is not under cultivation in this country. Mr. Elwes kindly furnishes the following note upon it :—"This fine beech is known in Chile as 'Coigue,' and is very abundant in the forests of the western slope of the Andes up to about 5,000 or 6,000 ft. in the neighbourhood of the Baths of Chillan, and as far south as I went on the shores of Lake Nahuel-huapi. It attains a great size in favourable situations, one which I measured below the Baths of Chillan being 22 ft., and another 27 ft. in circumference at 5 ft. from the ground. It grows in pure forest or mixed with *Araucaria*, and, higher up, with *Fagus antarctica*. It crosses to the Argentine side of the frontier wherever the rainfall is sufficiently heavy, but does not extend to the drier region below about 3,000 ft. I brought home seeds and specimens collected at Lake Meliquina on February 9th. This tree is often covered with a very beautiful parasite called *Myzodendron linearifolium*, DC., of which good specimens are in the Herbarium. I was told by Mr. Barton, who was felling this tree for timber on Lake Nahuel-huapi, that the timber was too heavy to float when green." The seeds mentioned by Mr. Elwes do not appear to have been received at Kew or, if so, they did not germinate.

F. antarctica is a deciduous-leaved species which grows intermingled with *F. betuloides* in the forests of Tierra del Fuego and extends far to the north into Chili. It is exceedingly rare in cultivation. Its foliage is variable in character, especially in the marginal cutting of the leaf-blade. In the var. *bicrenata* of De Candolle the leaves are mostly bicrenate, but in the var. *uliginosa*, now introduced by Mr. Elwes, they are multicrenate. Mr. Elwes has kindly supplied the following remarks about the latter :—"*Fagus antarctica* var. *uliginosa* is a smaller tree than *F. Dombeyi*, and is called 'Mere' in Chili. It occurs at higher elevations and forms a dense scrub on the Argentine side of the frontier, extending near the Baths of Chillan up to 7,000 ft., or more. On the mountains around Lake Nahuel-huapi it covers the summits up to 5,000–6,000 ft., and when I passed at the end of February the leaves had turned a brilliant red. It is affected by the same parasite that grows on *F. Dombeyi*, namely, *Myzodendron linearifolium*. The seeds which I brought home came from Lake Meliquina. At the Baths of Chillan I also found the bicrenate variety of this tree."

On the young trees at Kew raised from Mr. Elwes' seeds the leaves are $\frac{1}{2}$ to $1\frac{1}{4}$ ins. long, cordate with an oblique base, irregularly and minutely crenate, and with the petioles so short that the basal lobes of the leaf often project beyond the stem. The slender unbranched shoots (this year 3 ft. long) clothed with these small, regularly alternate, closely set leaves, give to the trees a most distinct appearance.

F. obliqua.—Although this species is said to have been introduced previously, we are not aware of any trees growing in this country other than those raised in 1902 from Mr. Elwes' seeds.

The largest of the trees at Kew are now 9 ft. high and the growths of the past summer $2\frac{1}{2}$ to 3 ft. long. Provided it proves hardy, it will evidently be a rapid-growing tree. Writing of this species Mr. Elwes says :—"This fine tree seemed to be confined to the lower levels in the territory south of the Bio-bio River, where it forms a large part of the forest and is cut for timber which is largely exported from Valdivia and Concepcion under the name of 'Roblé.' Some of this timber has been shipped to England by Herr von Voden, a merchant of Temuco, and has been tried for sleepers by the Great Western Railway Company, whose engineer at Swindon was good enough to send me a sample of it. It seems a hard, heavy wood of reddish-brown colour and compact grain, which would be suitable, when properly seasoned, for furniture.

"The forests are being rapidly destroyed by axe and fire and large crops of wheat being grown on the ground among the stumps.

"I collected seed of this tree at San Ignacio, where it is the host of a beautiful parasite, *Myzodendron punctatum*, Banks and Sol."

The leaves of *F. obliqua* are deciduous and, on the young trees at Kew, are oblong-ovate, doubly crenate, 2 to 3 ins. long, dark green above, paler and rather glaucous beneath.

W. J. B.

LIII.—HUANG-CH'I.

(*Astragalus Henryi*, Oliv., and other species.)

(With Plate.)

The Chinese drug *Huang-ch'i* is in considerable repute all over China. There are many kinds of this drug furnished by different species of *Astragalus*, and possibly of allied genera—plants of a herbaceous character with a thickened woody root-stock, which is the part valued. Chinese books acknowledge the existence of three or four kinds of the drug and one kind is figured in *Chih-wu-ming*, vii. 3.

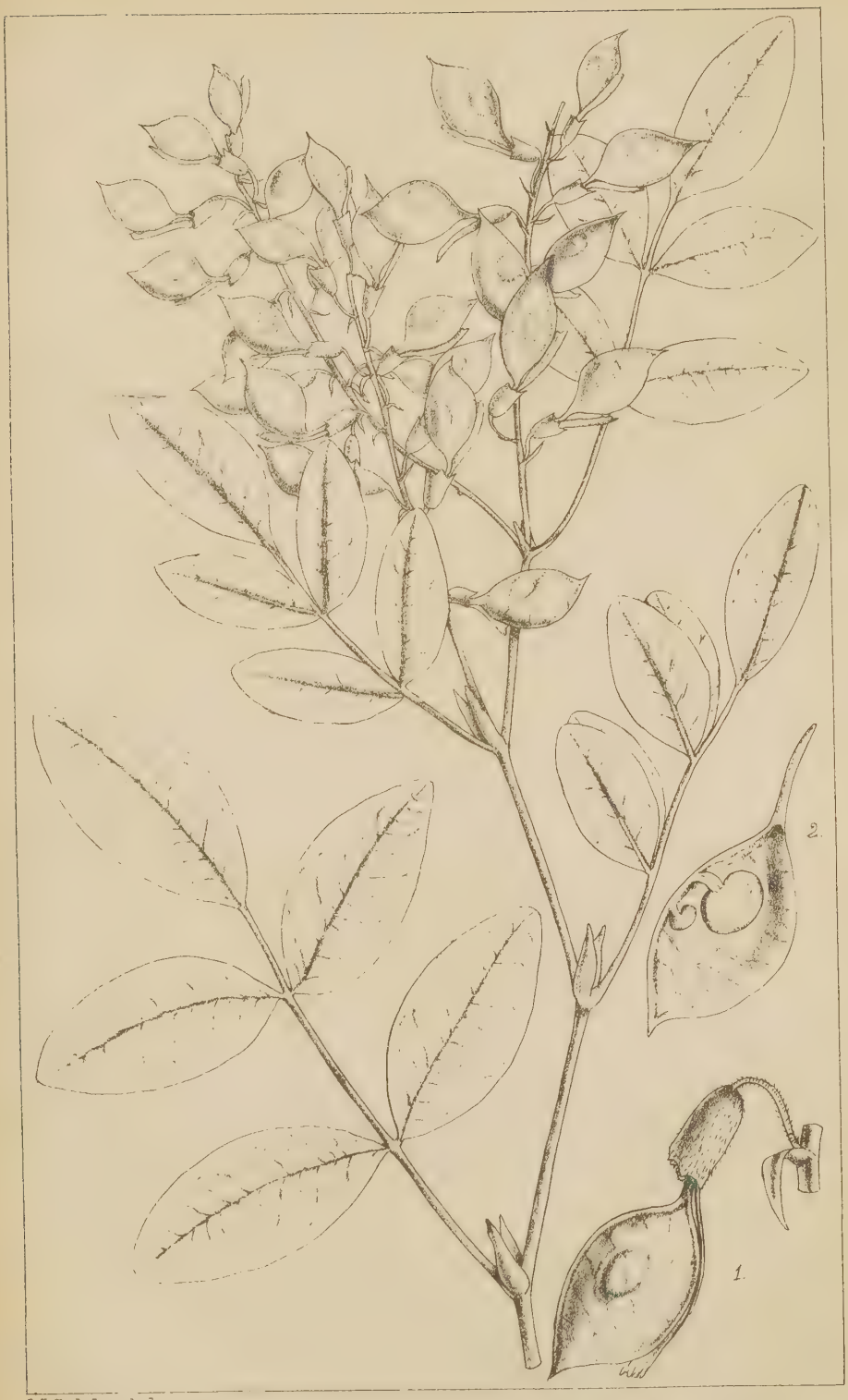
The Huang-ch'i exported from the northern ports (Newchwang, Tientsin, Chefoo) is furnished in part, if not entirely, by *Astragalus Hoantchy*, Franch., and *A. mongholicus*, Bunge. The first-named was discovered in Mongolia by Père David and is described in Franchet's Pl. David. i., p. 86. It is a very distinct plant with 8–12 pairs of leaflets and a much introflexed suture in the legume. *A. mongholicus* is allied to *A. Henryi*, Oliv., but has smaller and more numerous leaflets, and larger legumes containing six or more seeds. In Central China (Hupeh, East Szechuan, and probably Shensi) the drug is furnished by *A. Henryi*, Oliv., a figure of which accompanies this note. In Western Szechuan it is the product of *A. moupinensis*, Franch. In other parts of China probably other species yield the drug.

In Japan Huang-ch'i is furnished by *A. reflexistipulus*, Miq., and inferior kinds by *A. adsurgens*, Pall., and *Hedysarum esculentum*, Ledeb. Huang-ch'i is exported from the provinces of Manchuria, Chihli, Shantung, Szechuan and Hupeh to all parts of China chiefly through the ports of Newchwang, Tientsin, Chefoo, Ichang and Hankow. The total export from these ports averages about 400 tons annually, Tientsin and Hankow exporting two-thirds of the whole.

The different varieties of Huang-ch'i are distinguished by various names according to their place of origin or nature. Thus, Ch'uan-ch'i is the variety produced in Szechuan; Hsi-ch'i is the variety produced in Shensi; Hsi-fên-ch'i is a mealy variety produced in Shensi; Pei-ch'i, a variety from Manchuria and Chihli; T'iao-ch'i, the Manchurian kind exported from Newchwang; Hung-ch'i (Hung-p'i-Ch'uan-ch'i)—a reddish kind. The greater part of the Huang-ch'i passing through Ichang is on arrival at Hankow called by this name. The Huang-ch'i exported from Tientsin has an average value of Taels 12·50 per picul and is esteemed the most valuable kind of the drug.

The Hankow Huang-ch'i has an average value of Taels 5·60 per picul, and is considered inferior to that exported from any of the northern ports.

E. H. W.



M.S. del. et lith.

Astragalus Henryi, Oliv.

LIV.—MISCELLANEOUS NOTES.

Captain A. T. Gage, M.A., B.Sc., I.M.S., who has been Curator of the Calcutta Herbarium since 1898, has been appointed Superintendent of the Royal Botanic Gardens, Calcutta, and Director of the Botanical Survey of India.

Dr. D. H. Scott, whose appointment as Honorary Keeper of the Jodrell Laboratory was announced in the *Kew Bulletin* for 1892, p. 245, has relinquished the post which he has filled with such distinction during the past fourteen years, to the deep regret of all his colleagues, whose good wishes he carries with him on his retirement from Kew. The work done by Dr. Scott, and by those who have availed themselves of the hospitality of the Jodrell Laboratory during his Keepership, has been recorded from time to time in the *Bulletin*. Dr. Scott's eminent services while at Kew, and his distinguished contributions to palaeontological botany, have been recognised by the University of Aberdeen, which conferred on him the honorary degree of LL.D. in September, 1906, and by the Royal Society, which awarded him a Royal Medal in November, 1906.

Mr. W. H. Johnson, F.L.S., has resigned the post of Director of Agriculture, Gold Coast, which he has held since 1904. Prior to this date he was Curator of the Botanic Station, Aburi, having been appointed in 1898, after a few months' service as Acting Curator (*K.B.*, 1898, pp. 54 and 334). Mr. Johnson has done excellent work in the Gold Coast Colony. To his efforts the establishment of the Cacao industry is largely due ; he has also done much to further the establishment of rubber cultivation there. He has now joined the service of the Companhia de Mosambique, and has proceeded to Beira, Portuguese East Africa.

Mr. J. Stocks, formerly Private Secretary to the Director, has also accepted an appointment in East Africa.

Mr. Stanley Arden whose appointment as Superintendent of Experimental Plantations in the Federated Malay States was recorded in the *Kew Bulletin* for 1900, p. 15, has resigned that post, and has entered private employ as a rubber planter. It is now officially notified that Mr. J. W. Campbell, Superintendent of Government Plantations, Larut (*Kew Bulletin*, 1904, 13), has been appointed to succeed Mr. Arden, and that Mr. T. W. Main, whose appointment was noted in *Kew Bulletin*, 1906, p. 88, has been selected to succeed Mr. Campbell.

G. C. CHURCHILL.—The death, in his eighty-fifth year, of Mr. G. C. Churchill, which occurred at Clifton on 11 October, 1906, has deprived Kew of an old and tried friend.*

George Cheetham Churchill was born at Nottingham, where his father was a manufacturer, on 25 September, 1822. The branch of the Churchill family to which he belonged had not been long resident in Nottingham; it migrated there from Northampton where an ancestor had settled in the seventeenth century on his marriage with a daughter of Sir William Fleetwood of Aldwinkle near that town. Slr William's younger brother Charles, a Parliamentary General, married the eldest daughter of Oliver Cromwell. Churchill's mother was a daughter of George Cheetham of Stalybridge, whose nephew of the same name now represents that borough.

Churchill's father was drowned in the wreck of the Forfarshire off the Farne Islands in 1838, leaving his son, at the age of 16, to make his way in the world. Shortly after his father's death, Churchill, who had been educated at private schools in Nottingham, was articled to a local firm of solicitors, one of whose partners then acted as Town Clerk of Nottingham. At the close of his articled term, Churchill continued his legal training in the office of a solicitor in London.

Even as a boy Churchill appears to have been inclined to scientific pursuits. As a youth he was keenly interested in entomology, made a considerable collection of butterflies, moths, and beetles, and was able to extend the known range of more than one species. Shortly after the completion of his legal training he devoted some time to the study of land treatment, a subject to which he was attracted by his interest in the agricultural experiments carried on by Mr. (afterwards Sir) J. Lawes, and Dr. (afterwards Sir) J. H. Gilbert; an artist brother of the latter, Mr. Josiah Gilbert, became one of his most intimate friends. From this period of study may be dated the interest that Churchill took in geology.

In 1853 Churchill married Anna Maitland, daughter of the Rev. G. Laurie, of Camberwell, a lady of artistic and musical talent, in full sympathy with her husband's scientific pursuits. After his marriage he resumed legal work and settled in Manchester, where for the next ten years he was a successful solicitor. But though an excellent lawyer, he did not really care for the work, and it was a relief to him when in 1863 his increased income enabled him to abandon practice and give all his attention to science.

During the period of his active professional life in Manchester, his annual holidays were arranged with regard to the tastes of his wife and himself. He had been already attracted to some extent towards bótany; he became more and more so as time went on and commenced the formation of a private herbarium, specimens

* Facts relating to the career and work of the deceased, and impressions of his personality have been kindly supplied by his brother Mr. W. S. Churchill, by his niece Mrs. Fennell, by Sir W. T. Thiselton-Dyer, Canon Ellacombe, the Rev. Professor Bonney, Mr. G. H. Wollaston, Mr. F. F. Tuckett, and Professor Lloyd Morgan, to all of whom the writer wishes to express his warm thanks. Mr. Churchill's correspondence with Kew, which began in 1885 and continued till 1899, has also been made use of in preparing this sketch.

for which were accumulated during these annual tours. The earlier journeys were made in Scotland and Ireland, but these soon gave place to Alpine tours, at first in Switzerland, later on in Southern Austria. From 1861 onwards Churchill and his wife were accompanied by their artist friend Josiah Gilbert and Mrs. Gilbert.

As a result of these Austrian journeys Gilbert and Churchill collaborated, after the retirement of the latter from legal practice, in the preparation of a work entitled "The Dolomite Mountains: Excursions through Tyrol, Carinthia, Carniola, and Friuli in 1861, 1862, and 1863," Churchill being responsible for the scientific, Gilbert for the artistic portion of the book. But the talented Mrs. Churchill also took a considerable, if indirect, share in the work. She had written to friends at home, during the various journeys, a series of charming descriptive letters; these letters were referred to while the work was in progress, and were often of use in giving a graphic touch to the narrative. The third chapter in the work, which deals with a preliminary excursion made unaccompanied, in 1860, in the country to the east of Bosen, is by Churchill alone. The eighteenth chapter, which concludes the book and is devoted to a physical description of the Dolomite region, is also his. Botany, geology, and mountain scenery, however, by no means exhausted the interests of the party, for Churchill, though not himself master of any instrument, took much delight in good music and had a considerable knowledge of the subject. He was particularly interested in the popular and especially in the sacred music of Carinthia and other Slovak countries, and, assisted by his wife, made a considerable collection of Slovak melodies.

The work on the Dolomite Mountains, which was issued by Longman in 1864, at once took a prominent place in the literature of Alpine travel. It practically introduced to English travellers and climbers the previously little-known South Austrian Alps. After the work appeared Churchill was elected a member of the Alpine Club, and in the same year, 1864, he became a Fellow of the Geological Society. Two years later Mrs. Churchill died, and we find that Churchill devoted himself, again in company with his friend Gilbert, to writing a "Knapsack Guide to Tirol," which was issued by Murray in 1867.

In 1868 Churchill married, as his second wife, Rosaline, daughter of F. Millett, Esq., of the Bengal Civil Service. On account of his wife's indifferent health Churchill settled at Mentone, but a year later, for the same reason, he moved to Clifton, which continued to be his home from 1869 till his death. The change, however, did not effect its object; the second Mrs. Churchill who, though in full sympathy with her husband's scientific inclinations, was, owing to ill-health, unable to take part in his Alpine journeys, died in 1870.

In 1873 Churchill married, as his third wife, Frances, daughter of the Rev. E. Peacopp, of Boston Spa, Yorkshire, who survives him. Mrs. Churchill was the companion of all his Alpine journeys from 1873 onwards so long as he was able to go abroad at all, and gave him much assistance in the conduct of the extensive correspondence which he kept up with Continental botanists and plant

collectors. His herbarium shows that at least as early as 1869, in addition to the specimens obtained by himself, he had begun to add to his collection material derived from sets of plants issued by leading European collectors, and that from this time onwards he added in the same way to the number of alpines in his garden at Clifton. Some years later he began the practice of paying annual visits to Kew; visits which evidently afforded him the keenest pleasure and ultimately led to his taking a very practical interest in the establishment, for it was largely through his help that Sir William Thiselton-Dyer was able to build up the fine collection of alpines at Kew. In touch as he already was with Continental collectors, he gave assistance, from 1885 onwards, in negotiating for the actual supply of many of the plants themselves. A competent German scholar, some of these letters he wrote himself; those to French and Italian correspondents were, however, translated by Mrs. Churchill. His assistance to Kew did not end here; he had completely mastered the nomenclature of the European alpines, and his help was invaluable in checking this. His first actual gift to Kew consisted of some alpine specimens collected by himself and presented to the herbarium in 1884.

In 1892, in connection with a will he thought of making, he announced the intention he had formed of bequeathing to Kew his European herbarium. This consists of a general collection arranged in natural families and of numerous special collections made by individual botanists from which, up to this time, he had taken the particular specimens required to strengthen his general collection. "From my knowledge of the Kew Herbarium," he wrote, "the additions Kew would get would be:—good *Primulae* and other European hybrids; good specimens of species Kew already has, but more perfect than those of Kew; and specimens from other localities than those of Kew. Of course the great mass would be duplicates." This brief note accurately characterises the collection, which consists entirely of named specimens. As time went on he found it difficult to deal with the mass of material which kept steadily pouring in, and proposed to hand over the duplicates he did not require to Kew. In a letter dated 22nd October, 1895, he says:—"I wish to make a proposal. I have no room for any more dried plants or plant parcels, and yet there are three or four lists which I receive annually that are very likely to contain desiderata I should much wish to study. Now would you be willing to accept such desiderata for the herbarium, free, of course, of all cost to Kew, on condition I sent you a list of such which I intended to order? I would first examine them and then send them, carefully packed, to you." The arrangement thus suggested continued during 1896, when he presented to the herbarium:—Spanish plants collected by E. Reverchon, 53; plants from Baenitz' Herbarium Europaeum, 145; Transsylvanian plants from Sagorski, 82; specimens from the Wiener Tauschverein, 207; and again during 1897 when his gifts were:—from Baenitz' Herbarium Europaeum, 83 specimens; Spanish plants collected by Porta and Rigo, 220; rare and critical European specimens, 176; and specimens from Bulgaria, Servia, and Croatia, 66.

Failing health prevented his sending further specimens to Kew, and it would appear as if he had now become unable to overtake the task of incorporating desiderata in his general collection, for in a note written on 16th January, 1899, he speaks of "parcels of plants in an attic which contain many duplicates but some that are not in my cabinets; and I should like to send them over to the Kew Herbarium, and not give my executors the trouble of despatching them." Six months later he explained that he had been unable to undertake the despatch of these parcels mainly owing to the after effects of an accident, a fall in crossing a room, which had happened in 1892.

The parcels in question were never sent by Churchill, and the note referred to is the last item in the long and interesting series of letters written by him to Kew. They now, however, have reached the destination he had intended for them, having been received with rest of the collection bequeathed under his will to the Kew Herbarium.

The collection includes 50 cabinets filled with parcels of plants. Of these cabinets 28 are devoted to the general European collection mentioned above, the remainder contain portions of special collections from which specimens required to strengthen the general collection appear in most cases to have been already removed. There are, however, in addition, as many parcels of plants, for which there is no accommodation in the cabinets, as the cabinets actually hold. These parcels contain, in every case, portions of special collections; from some of them, as his correspondence shows, the specimens required to strengthen the general collection have not yet been abstracted. The whole herbarium includes about 10,000 species, varieties and hybrids.

An intimate friend of long standing writes:—"Mr. Churchill was a delightful companion and a very interesting talker on all subjects, whether one met him in a drawing-room or—as was more commonly the case—on the Downs. He was completely human and all human knowledge interested him."

The journeys described in "The Dolomite Mountains" were undertaken for mountain-travel rather than for Alpine climbing and, as we have seen, the authors during the tours of 1861, 1862 and 1863 were accompanied by their wives. Even as regards the Bosen journey of 1860, which he made alone, Churchill remarks that "the reader will probably have inferred that I shirk ice-work, and am not a member of the Alpine Club: my willingness to ascend ceases with the last phanerogamic specimen." Although he did, soon after this was written, become a member of the Alpine Club, he appears never to have contributed to its Journal, and certainly never receded from the attitude here adopted. For, in a letter written in November, 1891, he writes:—"Dr. Savage seems to be another member of the Alpine Club that has not bowed the knee to the Baal of mere climbing. I used to imagine that Ball, W. Mathews, Packe and myself were the only ones; but now I have been told of Dr. Savage, and lately of Sowerby." But if Churchill never professed to take an active part in, or indeed to personally care for mountain-adventure he had nevertheless more sympathy than these passages would imply with the special aims of 'climbers,' among whom he reckoned some of his most intimate friends.

The only contribution to geological literature which we owe to Churchill is the chapter from his pen on the physical structure of the Dolomite Mountains. Though this shows no sign of independent work it indicates that the writer had studied the more important books and papers relating to the physical geography and geology of the region, and proves that he was no mere summarist, but one who was competent to discuss and criticise the hypotheses that had been advanced with regard to the origin of dolomite. "In the two aspects of alpinist and geologist," remarks one who is himself equally and eminently both, "my general impression is that Churchill was a true lover of the Alps without being a climber in the technical sense, and had a good general acquaintance with geology without being a specialist. I imagine, but here I am venturing off my own ground, that in his knowledge of the Alpine flora he was second only to Ball."

This estimate of Churchill's acquaintance with the vegetation of the Alps is probably just; his knowledge of alpines was extensive and minute, nor was Kew alone indebted to him for the accurate determination of critical species. Another friend of many years standing, to whose garden Churchill paid annual visits, writes :—"As we went round the garden he was ready to examine every plant and to tell me if it was rightly or wrongly named. If he was uncertain he would take some of the plant home and in a few days came a full account of it, with the authorities. He was most painstaking and with his kind courtesy it seemed as if nothing gave him so much pleasure as to hunt out for a friend all the information in his power. I always felt that when I got his decision on a plant I had touched rock."

Plants other than European had little attraction for him, unless they were from the Himalayas or from Alpine China and were related to European species. Little of his great and critical knowledge of the Alpine flora ever was made generally available, though he took the keenest interest in the work of others and sometimes, as in the case of the issue of Ball's tables of the distribution of plants on the south side of the Alps, for the posthumous publication of which botanists are indebted to the piety of the late Director of Kew, he supplemented this interest with direct and active encouragement.

Another instance of his interest in matters alpine was afforded by the appearance of Huxley's paper 'The Gentians; Notes and Queries,' in the Journal of the Linnean Society, vol. xxiv., p. 101 (1887). The point in this paper on which Churchill particularly desired further light he describes (June 20, 1888) as "the—to me—astounding statement of Huxley's, at the end of his paper, read at the Linnean Society, that the more he examined the Gentians there, more and more varying forms present themselves, making it almost impossible to allocate these to the regular species of the floras. But he says not a word in all his paper of hybrids! My experience is so different to this that I hesitate to accept the statement." In a subsequent letter (June 26, 1888) he writes :—"I am very glad to hear you intend to take Huxley's paper . . . I have only to ask you to bear in mind the possibility of hybrids as well as of intermediate non-hybrid forms. Also if you would dry a few specimens of any plants that look like *G. germanica*, W.

For Kerner, as you know, has separated three species from what had been subsumed under the name of *G. germanica*, and named them *G. austriaca*, Kern., *G. Sturmiana*, Kern., and *G. rhaetica*, Kern. . . . Now *G. rhaetica* seems dominant in Tirol and I do not yet know if all my Tirol specimens are not that form and that *G. germanica* is not there at all. Then the question comes—is the form in Switzerland *G. rhaetica* or *G. germanica* or do both occur there? . . . Gremli in his 'Excursionsflora für die Schweiz,' 5th edit., 1885, which is three years later than the publication of the above, does not notice the matter and even in his 'Beiträge,' published only in 1887, omits to do so, though calling attention to the form *Sturmiana* as occurring near Bregenz."

Again, on November 9, 1888 :—"I regret from my selfish point of view that you did not go abroad, as I was curious to learn how the Gentian forms struck you unguided by the blinkers of published floras . . . . What you tell me about Huxley is news . . . . Where were the two isolated areas in the Engadine and which were the two species of Gentian and which the hybrid? When I was on the Albula and on the Julian Passes I found a good many hybrids such as those between *Gentiana verna*, *G. brachyphylla*, and *G. bavarica*, also *G.* supra-*lutea* × *punctata*; to say nothing of other orders."

A week later, November 17, 1888, he says Huxley's "account of the circumstances under which he met with the hybrid form *Gentiana punctata* × *lutea* is very interesting, and I hope next summer he will be able to observe other forms which he will conclude to be of hybrid origin. I wish he would go up to the summit of the Albula from Samaden some fine day about the middle of July, and I am much mistaken if he will not come across hybrids between *G. verna*, *G. bavarica* and *G. brachyphylla*. On the Alp about halfway between Bergün and the top of the pass I gathered one *Gentiana* supra-*lutea* × *punctata*; several *Pedicularis recutita* × *incarnata*; and *Cardamine alpina* × *resedifolia*. In Val Bever just over the Albula ridge *Gentiana punctata* × *lutea* is frequent, and specimens of these I have received from old Krättli. Huter also has got the same hybrid on Monte Roën in South Tirol, of course *inter parentes*."

Two years later, January 19, 1891, he wrote :—"as to Gentians. You say you don't believe in the species running into one another, as the result of your observations. This is precisely my experience, and I have not come upon a single instance pointing the other way. With this conviction I was struck with the note affixed to specimens of *Gentiana Gaudiniana*, Thom. (*punctata* × *purpurea*), in the Kew Herbarium, gathered by Christener of Bern on July 30, 1869. Christener says 'In allen Uebergangsformen, gar nicht selten zwischen unzahligen ex. der Eltern neben dem Martinets Gletscher auf der Alp nant oberhalb Bex.' And in Focke's 'Die Pflanzen-mischlinge,' Berlin, 1881, though nothing is said under the head of *G. purpurea* × *punctata*, yet at p. 256 under *G. lutea* × *punctata*, he says 'Kommt in allen Uebergangsformen vor,' and that all these were found in 1819 by Guillemin and Dumas on the Môle in Savoy. I can't refuse to believe this, but I should very much like to see the specimens. I don't think

either Kew or British Museum has any. When I was on the Albula in 1877 I came upon the hybrids between *G. lutea* and *G. punctata*, and I could only find two forms ; the one nearer to one parent and the second nearer to the other. On the Albula too I looked for hybrids between *G. verna*, *bavarica* and *brachyphylla*, and found them numerous and gathered many specimens, and I don't think I ever found more than one form of hybrid between each species. I used to lie down on the grass among them, and could always detect the hybrids by the different tint of blue they showed. Everywhere that I have botanised I have always been on the lookout, and I have never seen any case of 'Uebergangsformen.' I may say the same of *Pedicularis*, *Primula*, *Achillea*, *Campanula*, *Saxifraga*. One usually finds either a hybrid exactly between the parents ; or two, one nearer one parent, the other nearer to the other ; or three ; or finally four, as in *Primula minima* × *P. glutinosa*, where you have *P. Floerkeana* (super-*glutinosa* × *minima*), *P. salisburgensis* (sub-*glutinosa* × *minima*), *P. Huteri* (*Floerkeana* × *glutinosa*), and last *P. biflora* (*salisburgensis* × *minima*). Among *Cirsia*, however, Dr. Focke records *C. rivulare* × *palustre*, *rivulare* × *acaule*, and *oleraceum* × *acaule* as producing several 'Uebergangsformen.' But compared with the numerous cases of hybrid *Cirsia*, the number of those showing 'Uebergansformen' is, I think, very small. It seems to me that Huxley rushed too quickly to his conclusions." In a later letter, January 31, 1891, Churchill wrote :—"as regards the statement . . . . that horticultural experience does not confirm my view as to the limited number of hybrid forms in each case, I would reply that horticulture upsets the old state of balance of the conditions, and that therefore different results would arise. In nature the equilibrium does not quickly change, and therefore the new results are fewer. If you refer to all the best floras of Europe I think you will find that 'Uebergangsformen' are exceedingly few. So far as I have examined it is so." Once more, February 10, 1891 :—"If 'Uebergangsformen' were numerous among alpines Ball must frequently have come across such. Prof. Bruegger of Chur is about the greatest hybridomaniac—so Deseglise the greatest hybridophobist styled him—I know ; and yet in his 'Beobachtungen' on hybrids of the Swiss and neighbouring floras, professing to describe some three or four hundred forms, and which I have looked over at different times, I think I have not come across a single case. It is true that Gremli and Buser have pitched into him apropos of *Salices* and some others ; but that hardly touches the bulk of his descriptions. If he had ever come across cases of a series, of say five, six or more forms filling up by regular stages the interval between two recognised species, we might trust him to mention it. I have not seen mention of such in Kerner's writings, nor in Gremli, or Hausmann, or Hegetschweiler, or Schlosser. Huter's and Porta's experiences have been continuous in Tirol from 1860 to the present day, and I have never heard of such from them. My present conclusion is that the recognised species have long been in a condition of perfect equilibrium with their environment, only disturbed by insect action to a limited extent; but when you begin to cultivate them new forces are set in action and produce no end of changes." His last word on the subject, March 11, 1891,

is :—"'Uebergangsformen.' My experience, so far as it has gone, does *not* agree . . . as to 'the abundant occurrence in nature' of these. This term would apply of course both to natural hybrids and to seedling varieties. I have taken note more of the former of these. But the writers of the floras of different parts of the Alps agree with me rather, if their silence means anything. They never refer to the existence of numerous hybrid forms between two species, with the few exceptions I gave in a former letter. There is a complete 'conspiracy of silence' amongst them. When Kerner wrote on 'Primel-Bastarte' in 1875, would he not have carefully noted the existence of 'any number of intermediates' if he or his botanical friends had ever come across them? In idea three primary Bastarte and six secondary are possible, and yet Kerner says that these secondary Bastarte, as also the triple Bastarte, are 'extremely rare'; and among *Primulae* he only knows of *P. biflora* and *P. Huteri*, thus ignoring altogether the existence of 'any number of intermediates' between cowslip and primrose. Between these two last he describes but two : *P. brevistyla*, DC. (sub-*acaulis* × *officinalis*) and *P. flagellicaulis*, Kerner (super-*acaulis* × *officinalis*). Under the former head he refers to the difference in size=one-third of all the parts between Austrian and French specimens, but no hint is added of there being more than these two hybrids known. He quotes Boreau as testifying to the existence of these *two* hybrids in the centre of France. Now if Boreau had observed more than these two, would he not have described them? In Focke's 'Mischlinge,' p. 246, however, he quotes Loret as saying that at Pau he found '*four* Uebergangsformen' between *acaulis* and *elatior*! He adds, a little further on, 'evident transitions *back to the parents* (primrose and cowslip) do not appear to have been observed in a wild state; I have often sought for such near the lake of Geneva, but in vain.' . . . I know about *Geum rivale* and *montanum*, but I should like to know *how many* intermediates. I do not believe in any number. I have referred to Grenier and Godron's 'Flore de France,' and to Naegeli, but I am still inclined to maintain that in a *wild* state 'any number of intermediates' is a very rare phenomenon. Can Baker give me the three primary and six secondary intermediates between cowslip and primrose? Are they all in the Herbarium? When I have seen these I shall be more credulous of the existence of a possible tenth intermediate. There is plenty more to say; but my eyes and wrist are tired."

These extracts from Churchill's letters may serve to show how interesting as a correspondent he could be, and to indicate both the manner in which he faced any problem connected with the Alps, and the information he was able to bring to bear on its discussion.

The portraits of Churchill show that in middle life he was an exceedingly handsome man, in some respects bearing a strong resemblance to Tennyson. He was a man of unvarying kindness and gentleness, always ready to assist, from the stores of his knowledge or from his herbarium, those who applied to him for information regarding the flora of Europe. His liking for music has already been alluded to. He had not mastered any instrument, but during the year of his residence at Mentone he was fond of

singing in chorus with friends, and, after settling at Clifton, he took a great interest in the Bristol Musical Festivals. In oratorio music and orchestral concerts he found a particular pleasure.

A marked idiosyncracy was his constitutional dislike for tobacco, one effect of which was that he was never able to join the Bristol and Clifton Scientific Club which meets monthly to dine, and, after dinner, to read or to hear papers read, and to discuss them "in a cloud of smoke."

F. W. Burbidge.—Full and appreciative accounts of the life and work of this old Kewite appeared in several of the gardening papers shortly after his sudden death, which took place on Christmas Eve, 1905; but the fidelity and generosity of the deceased to Kew deserve recognition here.

Burbidge was born at Wymeswold, Leicestershire, on March 21, 1847; his father being a farmer and fruit grower. After spending some time in the gardens of the Royal Horticultural Society, at Chiswick, where he obtained many distinctions, he entered Kew, where he was equally successful. Enthusiastic in all branches of horticulture, and none the less a student of botany, he early developed considerable skill in wielding both pen and pencil, and part of his time at Kew was devoted to drawing plants for the general collection. After leaving Kew in 1870 he spent several years on the staff of "The Garden," and in writing works on various horticultural and botanical subjects; all of which were well received. Among these was his illustrated History, &c. of *Narcissus*, to which Mr. J. G. Baker contributed a descriptive classification of all the species. In 1877–8 he was engaged on an exploring mission to North Borneo on behalf Messrs. James Veitch & Sons, the object being the introduction of new and beautiful plants, in which he was highly successful. Specially interesting among his introductions of living plants were various species of *Nepenthes*, including the giant *N. Rajah*, figured in the "Botanical Magazine" last year (t. 8017), from one of Burbidge's original plants. The narrative of his travels and acquisitions is in his book entitled, "The Gardens of the Sun," 1880. Burbidge not only collected seeds and living plants, but he also dried a large number, and through the liberality of Messrs. Veitch, Kew received the first set amounting, with some given by Burbidge himself, to nearly a thousand species. Many species bear his name, and Sir Joseph Hooker named *Burbidgea nitida* (Botanical Magazine, 1879, t. 6403) "in recognition of Mr. Burbidge's eminent services to Horticulture, whether as a collector in Borneo, or as author of 'Cultivated Plants, their Propagation and Improvement,' a work which should be in every gardener's library." In 1879 Burbidge was appointed Curator of the Botanic Garden of Trinity College, Dublin, a post which he held till his death. He received a number of horticultural distinctions, including the Victoria Medal of Honour and the Veitch Memorial Medal, and in 1889 the Dublin University conferred on him, *honoris causa*, the degree of Master of Arts. He was also a member of the Royal Irish Academy. Throughout his career Burbidge was always faithful to Kew, and

being very fond of the early works in botany and gardening he often did her a service by presenting a book, or putting her in the way of procuring it. Among his gifts was a fine copy of the rare "Prodromi Fasciculi Rariorum Plantarum, &c.," of J. Breyn, 1739, containing the book-plate of a former owner, Robert James, Lord Petre, who had a notable garden at Thorndon in Essex, under the supervision of the celebrated Philip Miller. He also presented a considerable collection of wrappers of early numbers of the "Botanical Magazine," which bear many announcements and advertisements of great historical interest. Burbidge not only collected old books, but he read them, and was full of information, which he imparted to others in such a pleasant modest way that one was never tired of listening; and he had none but friends, because he rarely uttered a disparaging word of another.

W. B. H.

O. T. Hemsley.—In the Annual Report on the Government Agri-Horticultural Gardens, Lahore, for the financial year 1905–6, the President, addressing the Government of the Panjab, wrote:—"The gardens have sustained a great loss in the sad and untimely death of Mr. Hemsley, the late Superintendent, who succumbed on January 6th, after a short illness, to a malignant attack of small-pox. His energy and devotion to his duties have been acknowledged in previous reports. His work in 1905 was again deserving of all praise."

In reviewing this report the Chief Secretary to the Government of the Panjab wrote:—"The Lieutenant-Governor takes the opportunity of recording his regret at the death of Mr. Hemsley, to whose labours the improvement of the gardens has been so largely due."

Oliver Tietjens Hemsley, the only son of Mr. W. B. Hemsley, F.R.S., Keeper of the Herbarium at Kew, was born at Richmond, Surrey, on February 6, 1876, so that at the time of his death he had not yet entered his thirtieth year. He was educated at Dr. White's School, Turnham Green, and at King's College School, London. In 1893, when 17 years of age, he entered the Royal Gardens. In the Garden Lectures he took a distinguished place.

In 1898 young Hemsley went to India, and on his arrival was posted to the Cinchona Department in British Sikkim where, with the exception of a short period during which he acted as Curator of the Lloyd Botanic Garden, Darjeeling, he served as an Assistant till 1903. His duties in the Cinchona Department lay both in the factory and on the plantation. His inclinations, however, were more towards horticulture than planting, and in 1902 he expressed a desire to be transferred to a post in the plains, there to make himself more familiar with Indian gardening conditions than was possible in the comparatively temperate altitudes at which cinchona is grown, and so to qualify for subsequent promotion.

A vacancy occurring in the Royal Botanic Gardens, Calcutta, he was appointed Assistant Curator there in 1903. He had hardly taken up his duties in this capacity when an opportunity was given him of facing a difficult task. An Imperial Durbar was to be held that winter at Delhi, and the sites of the various sections

of the great Durbar camp had to be treated in such a fashion as to prevent their appearing, as otherwise in the cold weather they must, to be part of a dusty arid plain. The executive gardening duties connected with the Bengal section of the camp were entrusted to Hemsley. These he took up with enthusiasm, and—in spite of a breakdown in health—performed so well as to earn the commendation of Major Strachey, the officer in charge of the Bengal Camp, and of the late Mr. Gollan, Superintendent of the Saharanpur Botanic Garden, who was in administrative charge of the gardening operations generally.

As events transpired, young Hemsley did not return to Bengal. The impending retirement of Mr. H. G. Hein, the respected Superintendent of the Agri-Horticultural Gardens at Lahore, was announced, and Hemsley was chosen as Hein's colleague and successor. The quality of Hemsley's work at Delhi under circumstances of unusual difficulty augured well for his success at Lahore; nor was the anticipation belied. His work was spoken of in high terms in successive annual reports, the last melancholy reference being that with which this note opens.

Hemsley's was a bright and kindly disposition. Good tempered and warm-hearted, he made many friends. He was a keen volunteer; while an Assistant on the Cinchona Plantation he was an enthusiastic member of the Northern Bengal Mounted Volunteers; at Lahore he was an equally enthusiastic member of the Panjab Light Horse. This corps paid a worthy tribute to a devoted volunteer at his funeral, which was a military one, all the officers of the corps being present, as were officers representing the Staff of the Lieutenant-Governor and the 1st Panjab Volunteer Rifles. His own corps supplied the firing party, while crosses and wreaths were sent by the Lieutenant-Governor and Lady Rivaz, by the officers of his corps, and by the native staff of the Lahore Garden. His friends have since decided to erect a monument over his grave.

Hemsley married some time after taking up his appointment at Lahore and has left a widow and an infant daughter.

JOHN MAHON.—It is unhappily not rarely the case that the Bulletin has to record the death of a Kew man who, while his career has scarcely left the initial stages, has fallen a victim to the climate of one or other of our colonies whither he had gone, full of energy and enthusiasm, to carry on the work of some remote botanic station.

After a long illness J. Mahon, or J. M. Browne as he was known up to the time of his leaving Kew in 1897, died in the University College Hospital, Gower Street, on April 6 of the present year. An Irishman by birth, possessing many of the admirable qualities of his countrymen, he was born in Dublin, May 12, 1870. He remained in his native place till he came to Kew as a gardener in October, 1891. Having been promoted to the position of label writer he stayed at Kew for six years, winning for himself, by the amiability of his nature, the sterling goodness of his character, and ability considerably above the average, the appreciation of all those with whom he was

associated. He left Kew in May, 1897, to take up the duties of Forester at Zomba, British Central Africa, where he remained two years and a half. An interval of about a year at home was followed by his appointment as Assistant Curator of the Botanic Garden, Entebbe, Uganda. Shortly after, he became Curator, but in the spring of 1903 his health was so unsatisfactory that he was invalided home. His malady proved to be the terrible "sleeping sickness," a certain, but, in his case, a slow death. He battled manfully against the hopeless disease and the deplorable weakness engendered by it, and for some months, from October, 1903, to April, 1904, was employed as a temporary assistant in the Kew Herbarium. Subsequently he joined the staff of the Imperial Institute, but in the autumn of 1905 his illness necessitated the relinquishment of all work, and the remainder of his life was passed in the hospital, where he lay prostrate and helpless, and often in a comatose condition, till his death on April 6 of the present year, exactly 3 years to the day from the time he left his post in Uganda. His funeral took place at the Richmond Cemetery on April 10, and was attended by several of the permanent staff at Kew and the Imperial Institute. Mahon was married, and his widow now resides in Kew.

The Gardens are indebted to him for liberal contributions of seeds, tubers and plants, and to the Herbarium he sent several small collections of specimens which included a number of new species. The following plants, named in compliment to him, commemorate his services to systematic botany : *Dissotis Mahoni*, Hook. f., Bot. Mag. t. 7896 ; *Ipomoea Mahoni*, C. H. Wright in Gard. Chron. 1903, xxxiii. p. 257 ; *Brillantaisia Mahoni*, C. B. Clarke in Kew Bull. 1906, p. 251 ; *Mystacidium Mahoni*, Rolfe in Kew Bull. 1906, p. 116 ; and *Lissochilus Mahoni*, Rolfe in Bot. Mag. t. 8047. A portrait of Mahon appeared in the *Gardeners' Chronicle*, 1906, xxxix. p. 256, and his graphic descriptions of Tropical African vegetation were published in the same journal in 1904, xxxv. pp. 115, 130, 165 and 182, and in the *Journal of the Kew Guild*, 1898, p. 17, and 1903, p. 145.

S. A. S.

A. J. Jordan.— In a letter to the Director, dated Botanical Department, Trinidad, 8th August, 1906, Mr. J. H. Hart has written :—"I regret to report that Mr. A. J. Jordan, of this Department, died after a short illness of some six days on 6th August last of pernicious remittent fever."

The late Mr. Jordan before entering Kew, which he did on May 9, 1898, had been trained at Ballandean House, Inchture, Perthshire, and at Forbes House, Ham, Surrey. In a letter accompanying his application Mr. Jordan speaks of the prospect of entering Kew as one that he had cherished for years, "my object being solely to learn." "A small man, but intelligent and likely" is the expressive comment on his application form.

In 1899 Mr. Jordan was selected for service in the West Indies. He reached Dominica on June 27, 1899, and after spending some time at the Botanic Station there, so as to become accustomed to West Indian conditions, to get to know how to manage native

labour, to learn the methods of keeping books and become familiar with the details of office work generally, he was posted to Montserrat as Agricultural Instructor, subsequently becoming Curator of the Botanic Station in that Island. Early in 1905, he left Montserrat to become Curator of the Botanic Station in Antigua. Later in the same year he was transferred to Trinidad, where he held charge of the Government House Gardens under Mr. Hart till his death, which occurred, at the age of 32, in the course of what appears to have been a somewhat general outbreak of fever.

Mr. Jordan was a man of sincere religious convictions. He married after reaching the West Indies and has left a widow and one child. With exemplary forethought he had made provision for them by adequately insuring his life.

The Old Cedars at Kew.—The death of one of the fine old Cedars of Lebanon in the gardens unpleasantly reminds us that their numbers are gradually and surely diminishing. The adverse influences of London smoke and a sterile soil no doubt shorten the lives of these trees in Kew, and their decadence has certainly been accelerated by the large proportion of droughty summers experienced in the Thames Valley since 1893. The particular tree whose death we record was one of the group growing near the Pagoda. It was 75 ft. high and its trunk was 14 ft. 2 ins. in circumference near the base, and 11 ft. 7 ins. at 10 ft. from the ground. It contained about 300 cubic ft. of timber. The exceeding minuteness of the layers of wood put on in recent years makes it difficult to ascertain the exact age of this tree by counting the annual rings, but, as near as one can tell, it was between 145 and 150 years old. It is probable, therefore (allowing it to have been a few years old at the time), that it was planted about the time the Pagoda was completed (1762). This is not a great age for the Cedar of Lebanon to attain, for there are specimens still in healthy existence in this country known to be a century older. But unless there comes a revolution in the methods of coal consumption in the metropolis, even that duration of life is not likely to be equalled by the trees planted in Kew during the last 50 years. We have recently learnt from Sir Joseph Hooker—whose recollections of Kew go back more than 60 years—that, within his memory, the Cedars of Lebanon were growing so thickly all round the base of the Pagoda that the ground was quite hidden from the view of anyone looking down from the top. These trees have died one by one till only three remain. The remainder of the big Cedars are disposed about the gardens as follows :—Three on the mound to the west of the Pagoda known to the workmen as " Moss (? Mosque) Hill " ; three in the Rhododendron Dell ; two in the Herbarium grounds ; and one near each of the following sites—Sun Temple, Brentford Gate, Poplar collection, Flagstaff, and Victoria Gate. Most of these (16 in all) girth from 12 to 14 ft. In addition to them, and representing, no doubt, a later planting, are five smaller specimens near the Rhododendron Dell, two near the Director's Office, and one near the sunk Rose Garden.

The specimen growing near the Flagstaff is rather remarkable for an enormous branch which grows out from the trunk at 6 ft. from the ground and extends in a horizontal direction for 60 ft.; it is 6 ft. 6 ins. in circumference near the trunk.

Lomatia obliqua.—When Mr. H. J. Elwes visited Chili in 1901–2 he collected various seeds which he presented to Kew. Among them were seeds of *Lomatia obliqua*, R. Br., which he found in February "between Quillen and Junin at an elevation of 3–4,000 ft." Junin de los Andes is a town on the Argentine frontier, and the seeds were collected in Argentine territory. Plants were raised from them and some have since been distributed under the name of *Guevina avellana?*, the seedlings bearing a close resemblance to seedlings of that plant. The mature plants, however, differ widely, and it is now clear that Mr. Elwes' plant is *Lomatia obliqua*, which is common in the south of Chili, where it forms a shrub or small tree up to 40 ft. high (Bridges); it is appreciated locally for its prettily grained wood which is used for making furniture. There is no record of this species of *Lomatia* having previously been grown in Europe, and as it is at least as hardy as its relations *Embothrium* and *Stenocarpus*, and is, moreover, an evergreen with large ovate serrated leaves and axillary clusters of white flowers, it is likely to become established in gardens.

Presentations to Museums.—Fibre from Uganda (*Asclepias semilunata*, N.E. Br.), *Asclepiadeae*.—Mr. M. T. Dawe, Director, Scientific and Forestry Department, Uganda, has forwarded for the Museum a sample of fibre prepared from the stems of this plant, which attains a height of 2–5 ft. and is found in Nile Land, Lower Guinea, and South Central Africa. A report on this fibre appeared in the Bulletin of the Imperial Institute, vol. iii., No. 4, 1906, p. 316.

Fibre from Gold Coast (*Triumfetta semitriloba*, Jacq., var. *africana*), *Tiliaceae*.—The Cort Development Syndicate, Limited, recently submitted dried specimens of the above plant from the Gold Coast for determination, and subsequently presented samples of fibre obtained from it for the Museum. The fibre had been submitted to a London broker, who reported with regard to it that if clean and uniform in length and strength it would realize about £27 per ton.

Floss from Labrador (*Eriophorum vaginatum*, L.), *Cyperaceae*.—Flowering specimens of this plant collected by Sir W. MacGregor in Chidley Peninsula, Labrador, have been placed in Case 84, Museum No. II.—Under the name of Supput (Eskimo) the silky bristles of the flowers are used to receive sparks from two pieces of pyrites, in making fire.

Australian Grass Wrack (*Posidonia australis*, Hook. f.), *Naiadaceae*.—A marine plant peculiar to Australian waters. A correspondent recently forwarded for determination a sample of fibre from this plant, with a note to the effect that large quantities

of the fibre, washed up on the beach in certain places on Spencer's Gulf, are sent to England for the manufacture of gun-cotton. A similar sample was received some time ago from the same locality, with information that it was found on the shore below high-water mark, and about 12 ins. below the surface, the deposit from which the sample was taken being about 6 ft thick, and covering an area of 300 acres.

PRIMITIVE BOXWOOD SUNDIAL.—The Museum is indebted to Mr. Edward Lovett, of Croydon, for a neatly made sundial, such as is used by peasants in the Pyrenees. It is cylindric in shape, $3\frac{1}{2}$ ins. high, and $\frac{7}{8}$ in. in diameter. The stile or gnomon is fixed in a slot in the movable head, which may readily be adjusted when required for use. Upright lines at equal distances on the cylinder indicate the hours, whilst letters around the base represent the months of the year. *See* Case 103, Museum No. I.

SEYCHELLES PRODUCTS.—H.E. the Governor of the Seychelles has presented to the Museum a sample of the perfume 'Ylang Ylang,' presumably obtained from the flowers of *Cananga odorata*, Hook. f. & Thoms. (*Anonaceae*), which is the source of the Ylang Ylang oil of commerce. In connection with the trade in this product, particulars given in a recent report by Messrs. Schimmel & Co., of Leipzig and New York, are of interest. It is stated by them that "according to the most recent reports from Manila, dating from the end of January last, there was then a scarcity of blossoms, and the distillation has been interrupted in consequence ; but this is now probably past, as a shipment has meanwhile been advised by cable. Our friends in Manila make every possible effort to increase the production to such an extent that the consumption can always be fully satisfied. According to official consular reports the value of Ylang Ylang oil exported from Manila in the year 1904–05 amounted to 100,349 dollars, *i.e.*, about 300 dollars less than in the two preceding years." The sample will be found in Case 2, Museum No. I.

Specimens were at the same time received of the MOZAMBIQUE ORANGE (*Citrus Aurantium*, L., var.), *Rutaceae*, Case 20, Museum No. I ; also fruits of CAPUCIN (*Northea sechellana*, Hook. f.), *Sapotaceae*. *See* Case 73, Museum No. I, and drawings 467, 486, and 501 in the North Gallery.

Chinese Wood Oil.—The following passage, taken from the annual *Report on the Botanical and Forestry Department, Hong Kong*, for 1905, by Mr. S. T. Dunn, supplements the information as regards this substance already given on pp. 117–121 of the current volume of the *Bulletin* :—

"WOOD-OIL.—Wood-oil is abundantly produced in the Province "of Fokien and is one of the chief products brought down the "Min from the western part of the Province. At Buong Kang, "near Yenping, there is a large plantation of wood-oil trees, and "as three weeks were spent there during the recent investigation "of the flora of Fokien, the opportunity was taken to ascertain as "much as possible as to the industry. The trees were of two "kinds, locally known as Hwa Tung and Guong Tung. The

"names refer to the distinguishing character of the fruit, which "is sculptured in the first, smooth in the second. The trees were "in flower and were easily recognised as *Aleurites cordata*, and "another species of the same genus which has been in cultivation "in the Hong Kong Botanic Gardens for many years but has not "yet received a name. I understand from Mr. Hemsley, keeper "of the Kew Herbarium, that it is undescribed and that he has it "in hand at Kew." [Mr. Hemsley has now named this *Aleurites Fordii*, see *Kew Bulletin*, 1906, p. 120.] "The Hwa Tung (*Aleu-"rites cordata*) is the most valued because all the flowers of the "majority of trees produce fruits, from which the oil is made, "while in the second kind a few flowers only in each cluster are "perfect, quite 80 per cent. being male flowers. Why this kind "is planted at all I was unable to discover. The trees are raised "from seed and planted out when about three years old. They "arrive at bearing in five or six years. The nuts are gathered "when ripe, pounded up and placed in the usual Chinese oil "presses. The pressure is applied by wedges, and the oil is "collected and taken to market in a crude state.

"It does not appear to have been suspected before that wood-"oil was a mixture of the products of two species. A sample of "seeds of the new Guong Tung have been secured for trial at the "Imperial Institute, and if they yield oil superior in quality to "the wood-oil of commerce the tree will be tried in the New "Territory."

Professor A. H. Church has called our attention to the following paragraph on Chinese wood-oil in C. H. Hall's "The Chemistry of Paints and Paint Vehicles," p. 90 :—

"The odour is very characteristic and stubbornly resists destruc-"tion, regardless of the manner in which the oil is treated. This "admits of its identification when present in but small proportions "in varnishes, &c., regardless of other constituents. Another very "interesting property is the instant change into a jelly-like sub-"stance when heated to about 285° C. to 300° C. The material "this produces is insoluble in all ordinary solvents, and cannot be "melted by further heating."

In Diplomatic and Consular Reports, Annual Series, No. 3725, p. 96 (1906), Mr. A. Hosie mentions Sesamum Oil, which is only a semi-drying oil, as another oil used as an adulterant of wood-oil.

Prevention of Decay in Ripe Fruit.—In the *Journal of the Board of Agriculture* for 1905, pp. 305–306, an account was given of a series of experiments conducted in the Jodrell Laboratory, Kew, with the object of ascertaining whether, by special treatment, the period during which ripe fruit may be kept in perfect condition is capable of being prolonged.

The rotting or fermentation of ripe fruit having been shown by Pasteur to be due to the presence of living organisms on the surface, the object of the research was to ascertain whether by the destruction of these organisms the processes to which they give rise are preventible. The fruits dealt with consisted of ripe

cherries, gooseberries, grapes, pears and strawberries, not specially isolated, but purchased from local fruit shops or from street vendors.

The method of treatment employed was simple, inexpensive and free from danger. It consisted of immersion of the fruit for ten minutes in cold water containing 3 per cent. of commercial formalin (=40 per cent. of formaldehyde). The result was to show that whereas similar quantities of untreated pears placed side by side with the disinfected examples had in ten days become so mouldy and decayed as to be unusable, the treated individuals remained perfectly sound. In the case of cherries and gooseberries, seven days; in the case of grapes and strawberries, four days were sufficient to render the untreated examples worthless. In every instance the corresponding samples of fruit were perfectly sound when the untreated samples had become unfit for use. Various preservatives were experimentally tried but having regard to the essential points, efficiency, simplicity, cheapness and freedom from danger in its use, formalin stood easily first.

The method of preservation described appearing likely to be applicable to imported as well as to home-grown fruits has been tested again during 1906, with the result that the experience of the previous year has been confirmed so far as home-grown fruits are concerned. It has also been extended to other fruits such as apples and bananas which are largely imported to this country from oversea, and shows that in these as in the case of the fruits tested during 1905, the treatment described effectively prevents decay. The detailed account of the experience of 1906 will probably appear as a sequel to that of the 1905 experiments and should be consulted. In the meantime the present opportunity is taken of inviting the attention of colonial fruit exporters to the results already obtained and described.

One very important feature of this method of treatment is that it is equally applicable to fruit which is not quite ripe, and that it does not interfere with the normal course of ripening. The flavour is not thus interfered with, as is so often the case when fruit is kept for some time in a refrigerator. Another important feature is that when only the surface of a fruit is affected by the decay due to the presence of these destructive organisms, the cause of the decay is destroyed and the process is sometimes checked.

In the case of fruits like strawberries, which are entirely eaten, the treated fruit should be plunged for five minutes in pure cold water after its removal from the formalin solution. But where the fruit has a rind or skin which is not eaten this is unnecessary and may be omitted with advantage. The fruit after being immersed should be placed on some soft open material to drain and dry.

Botanical Magazine for September.—This number contains figures of *Ficus Krishnae*, C. DC., *Catasetum galeritum*, Reichb. f., var. *pachyglossum*, Reichb. f., *Ribes viburnifolium*, A. Gray, *Linospadix Micholitzii*, Ridley, and *Cereus Scheerii*, Salm-Dyck. The *Ficus* is a new species most nearly allied to *F. bengalensis*, Linn.,

and is remarkable in having cup-shaped leaves, the inside of the cup being formed by the under side of the leaf, a condition hitherto unknown. The Kew plant was received from the Royal Botanic Gardens, Calcutta, in 1902, and flowered for the first time in 1905. It is a native of India, but the precise locality is unknown. The variety of the rare Brazilian *Catasetum galeritum* was figured from material sent to Kew by Sir Trevor Lawrence, Bart., with whom it flowered in February last. The female flowers of this species are unknown. *Ribes viburnifolium* is a very distinct species belonging to the section Ribesia, and is a native of Lower California and Santa Catalina Island. The persistent leathery leaves are ovate-orbicular, sharply toothed and gland-dotted. Its small flowers are rosy, followed by small, oblong, red fruits, which often remain on the plant till the succeeding year. The Kew plant—now about seven feet high, trained on a wall—was raised from seed received from the Harvard Botanic Garden in 1897. *Linospadix Micholitzii*, a New Guinea species, is unique in the genus by reason of its unisexual spadices. Its introduction to our gardens is due to Messrs. Sander & Sons, by whom a plant was sent to Kew in 1896. The Mexican *Cereus Scheerii* has been in cultivation at Kew for many years. The plant figured flowered in 1900 and during the two succeeding years. It has since died. The species was named in commemoration of Mr. Frederick Scheer, of Kew, the author of "Kew and its Gardens," published in 1840.

Botanical Magazine for October.—The plants figured are:—*Odonotoglossum naevium*, Lindl., *Abies Mariesii*, Masters, *Blakea gracilis*, Hemsl., *Chloraea virescens*, Lindl., and *Passiflora punctata*, Linn. The *Odontoglossum* is a Colombian species allied to *O. gloriosum*, Lindl. and Reichb., from which it differs in having undulate sepals and petals, and subhastate lateral lobes of the lip. The plant figured flowered at Kew in February last. *Abies Mariesii* is a handsome Japanese species which was first introduced to cultivation by Messrs. James Veitch & Sons through their collector, the late Mr. Charles Maries. The figure was prepared from material sent to Kew by Messrs. D. Stalker & Son, who procured it from a tree growing on the estate of the Earl of Elgin, at Dumphail, near Nairn. This is believed to be the first occasion on which the tree has produced cones in Britain. *Blakea gracilis*, a Melastomaceous plant, native of Costa Rica, has rose-white flowers about an inch and-a-half in diameter. The Kew plant which furnished the material figured was purchased from Messrs. Lemoine & Sons, of Nancy, in 1904. *Chloraea virescens* has been re-introduced from Chili by Mr. H. J. Elwes, F.R.S., who sent plants to Kew, where they flowered in April, 1903. Its flowers are large, yellow veined with green, and are arranged in a dense raceme, four to six inches long. The *Passiflora* is a small-flowered species with sublunate leaves prettily variegated with purple, a native of Colombia, Ecuador, Peru, and Brazil. The figure was prepared from a plant received from the State Botanic Gardens, Brussels, in 1904, under the name of *P. maculata*.

Botanical Magazine for November.—Figures and descriptions are given of the following plants :—*Lilium myriophyllum*, Franch., *Lycaste dyeriana*, Sander, *Cotyledon devensis*, N. E. Brown, *Ribes cruentum*, Greene, and *Pleione yunnanensis*, Rolfe. The *Lilium* is one of the allies of *L. Brownii*, F. E. Brown, and is a native of Yunnan and North-west Szechuen, having been introduced into cultivation from the last-named province by Messrs. James Veitch & Sons, who supplied the material figured. Franchet, when he described the species, had not seen a bulb, but remarked the presence of a rhizome. Messrs. Veitch sent a specimen bearing a bulb. *Lycaste dyeriana*, a Peruvian species, is curious in having, like *Cattleya citrina*, Lindl., and a few other Orchids, a pendulous habit. The plant drawn was received, in 1903, from the Royal Botanic Garden, Glasnevin ; it flowers annually at Kew. The *Cotyledon* is of garden origin, and is probably a hybrid between *C. glauca*, Baker, and *C. gibbiflora*, Baker. The plant is remarkable in the genus on account of its extraordinary stature, having a stem fifteen inches high, and oblanceolate leaves eight to ten inches long, while the flower stems are as much as five to seven feet long. The Kew plant was received from Messrs. Dicksons, of Chester, in 1902. *Ribes cruentum* is a pretty species belonging to the section *Grossularia*, and is a native of the Western United States. Its globose crimson fruits are armed with long straight prickles. The material figured was obtained from a plant purchased from Mr. L. Spaeth in 1899. *Pleione yunnanensis*, from Yunnan, is a new introduction to gardens, and differs from the species already in cultivation by having globose-ovoid pseudobulbs and a taller scape. The drawing was prepared from material sent to Kew by Messrs. Suttons & Sons, Reading.

Lilium Brownii.—The name *Lilium Brownii* has been used for two different plants ; first by Poiteau in Rev. Hort. 2me sér., ii., 496 (1843), for a plant which is synonymous with *L. japonicum*, Thunb., Fl. Jap., 133 (1784), and afterwards for another species by F. E. Brown, a nurseryman at Slough, in whose catalogue the name first appeared. A description of the Slough plant was published by Spae in Ann. Soc. Agric. Gand, i., 437, t. 41 (1845), who quoted as the authority "Brown in litt." In the same year this plant was also described by Lemaire and figured in the Flore des Serres, t. 46, and enumerated by Mielle in his catalogue ; as a result these writers have sometimes been regarded as the authorities for the specific name. The plant referred to in the Botanical Magazine and now extensively grown as *L. Brownii*, of which several colour forms exist, is this *L. Brownii* of F. E. Brown, not that of Poiteau.

L. japonicum, Thunb. (which is confined to Japan), has glabrous filaments, fewer and irregular bulb-scales, more membranous shortly-petioled leaves, and a more widely campanulate perianth than *L. Brownii*, F. E. Br., while the latter has numerous regularly imbricate bulb-scales, usually sessile leaves and papillose filaments, and is a native of China and the Corean Archipelago.

C. H. W.

Flora Capensis.—Another part of this work (vol. iv., sect. i., part iii., pp. 337–480) was issued in October, 1906. It contains the remainder of the *Ericaceae* by Mr. N. E. Brown; the *Plumbagineae* by Mr. C. H. Wright; the *Primulaceae*, *Myrsinaceae*, and *Sapotaceae* by the late Dr. W. H. Harvey, with additions by Mr. C. H. Wright; the *Ebenaceae* by Mr. W. P. Hiern; and part of the *Oleaceae* by Dr. W. H. Harvey, with additions by Mr. C. H. Wright. The genera of the *Ericaceae*, apart from the genus *Erica*, constitute one of the most difficult groups in the gamopetalous flowering plants on account of the often exceeding smallness and the glutinous nature of the flowers of many of their species. Twenty-two genera, including four new ones, are described; and out of 159 species 66 are new. The *Plumbagineae* are represented by eleven species of *Statice*, three of *Plumbago*, and *Vogelia africana*. The *Primulaceae* are represented by three species each of *Anagallis* and *Lysimachia*, by the almost cosmopolitan *Samolus Valerandi*, and by *S. porosus*, Thunb., an endemic species. The *Myrsinaceae* and *Sapotaceae* are represented by three genera and eight species, and three genera and sixteen species, respectively. The *Ebenaceae* are relatively numerous, the four genera numbering collectively 37 species.

The late Dr. Harvey's manuscript is printed almost as he left it, except as regards the geography. Strange to say, it contains descriptions of about half-a-dozen new species which nobody had taken up during the interval of 40 years since it was written.

Manual of the New Zealand Flora.—It is now upwards of 40 years since Sir Joseph Hooker's 'Handbook of the Flora of New Zealand' appeared, and botanists have long felt the want of a new edition, or a new work, embodying the results of the always active investigation of the vegetation of that country during this considerable period. In the *Kew Bulletin* for 1899, p. 21, notice was taken of the fragmentary *Students' Flora of New Zealand*, left incomplete owing to the lamented death of Professor T. Kirk. It was then announced that in addition to the publication of the fragment, arrangements had been made for the preparation of a *Flora* of the country on a less comprehensive plan. Now comes Mr. T. F. Cheeseman's admirable 'Manual,' containing descriptions of all the native flowering plants, ferns, and lycopods, &c.—in other words, of all the vascular plants—which shows that there has been an increase of about one-third in the number of species during the period indicated. Unfortunately this book does not fully meet the requirements of local botanists, because New Zealand is in the peculiar position of sheltering upwards of 600 species of plants of foreign origin, many of which are exceedingly abundant. Indeed, in Mr. Cheeseman's words, they now constitute the larger proportion of the Flora in some districts, and there is no part of the country, however remote, into which some plants of foreign origin have not penetrated. Mr. Cheeseman gives a list of the colonists, and expresses a hope that he may be able to publish a companion-volume dealing with this foreign element, for after all it is as necessary for the botanist to know the aliens as to know the natives.

In the meantime, as a large proportion of them are British, he recommends students to procure Hooker's *Students' Flora of the British Islands.*

W. B. H.

Text-book of Fungi.*—The interest aroused in the fungi by the methods of investigation initiated by De Bary, and the extreme importance of a clear understanding of their relations to other organisms, especially to mankind and to animals and plants of economic value, have resulted in so rich a harvest that the books of even a few years ago are quite inadequate guides to the study of these plants. The old landmarks have been shifted or even swept away, and old problems have been resolved, but only to be replaced by new and still more perplexing ones. New methods of research have opened up new possibilities of advance; and new hypotheses have been framed as to the relations and origins of the several groups. Ideas unfamiliar to the writers of the existing text-books have found expression, and have been fruitful in results, which form a starting point for new investigations. Thus there has arisen a pressing need for a trustworthy guide to the results of recent years, that should state clearly what has been established, and indicate problems in need of investigation. Such a book could be produced only as the fruit of long-continued personal investigation of the structure and life histories of numerous types of fungi, and of intimate acquaintance with the writings of many investigators, scattered through the recent literature of almost every civilized country. Access to the necessary literature can only be obtained in a very few libraries. Few botanists possess the qualifications required in the preparation of such a work, and there is reason to welcome the *Text-book of Fungi* recently issued by Mr. George Massee, whose familiarity with the fungi has been so amply proved by previous books and papers, while the library of the Royal Botanic Gardens at Kew has furnished him with the requisite literature. Even with these advantages the task must have been a very heavy one. The object of the book, it is stated in the preface, is to serve as an introduction to the comparatively new lines of research that have led to so great an advance in our knowledge of fungi from so many new standpoints, and also to indicate where fuller information can be obtained. The field to be surveyed is wide, and one might be excused a doubt if it were possible in a small manual to give an adequate account of the many different lines of progress. But a careful perusal of the book (and it is not one that yields itself to other than careful study) reveals how thoroughly the author has studied these plants and the literature that relates to them; and it also shows how desirous he is to represent truly the opinions held by the several writers, while ready at all times to give reasons for the beliefs held by himself.

The several topics are well arranged, beginning with the cell and its various parts, passing on to the tissues and the anatomy and morphology, then to the methods of reproduction, sexual and

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* Text-book of Fungi, including Morphology, Physiology, Pathology, Classification, &c., by George Massee. 8vo. London: Duckworth & Co. 1906.

asexual, the dispersion and germination of the reproductive cells, the nutrition and effects on them of varied environments, enzymes, and ferments, parasitism and the relations of the parasites to their "hosts," symbiosis, various agencies, chemical and physical, that affect their well-being, and their distribution in space and in time. A chapter on "personal views in phylogeny" opens up several important questions, and will be found both interesting and suggestive, whether the author's views do or do not commend themselves to the reader. The very important practical questions of diseases produced by fungi, and the action of the legislature with a view to checking the spread of disease, receive careful consideration. The last part of the *Text-book* is devoted to the exposition of the systematic groups, in the course of which their relations to one another are discussed, and reasons are adduced for the conclusions arrived at. A most valuable feature is a list, at the close of each section, of all important works relating to it. There are many excellent wood-cuts, which add much to the value and clearness of the exposition. Mr. Massee deserves the thanks of students of fungi for having placed at their service an exceedingly useful and stimulating book, in which they will find aids to further research.

But there are certain features that should be altered in a future edition. Among these are occasional obscurities in expression, which might readily be misunderstood, and would probably be so by one using the book as an introduction to the fungi. It is at times difficult to be sure whether some passage states the author's own view of the question or is quoted by him, but not accepted; *e.g.*, on page 68, one might suppose that he accepted the multiple or polyphyletic origin of fungi from algae, which the statement of his "personal views on phylogeny" shows he does not. In the section on classification the relative subordination of the several grades would be much easier to follow were the names of families and lower grades not all printed in type of the same size, a size, by the way, less important, as regards the appearance of the type, than the frequent heading in capitals "KEY TO . . . " The names of the families and sub-families alike are made to end in *eæ* or *ieæ*, so that there is confusion between these grades when a sub-family of the same name exists within the family, *e.g.*, in "*Périsporieæ*." But these are all minor defects, which detract but slightly from the value of the book as a guide to the study of fungi. Its usefulness will be greatest to those who already possess some knowledge of the subject and can appreciate its merits; the tyro may find both the terms and the ideas somewhat beyond his depth for a time.

Kew Bulletin: Additional Series VII.—The various papers dealing with rubber that have appeared in the *Bulletin* since 1887 have been collected as the third instalment of "Selected Papers from the Kew Bulletin," and issued as the seventh volume of its "Additional Series." The following preface accompanies the reprint:—

"The object of the volumes of 'Selected Papers from the Kew Bulletin,' to which the present one belongs, has been explained

in the preface to the first selection of the kind, which deals with 'Vegetable Fibres,' and was issued eight years ago.

"The practical value of previous selections has been so great that the issue of the present volume, which deals with 'Rubber,' requires no explanation.

"The arrangement of the papers here reprinted from the pages of the *Kew Bulletin* is that adopted in the selection which deals with 'Fibres'; the notes and papers regarding individual rubber-yielding plants are given in the sequence adopted in the *Genera Plantarum* of Bentham and Hooker, of the natural families to which the various species belong. Those few papers, of a general character, which cannot in their entirety be allocated to particular natural families, and at the same time cannot conveniently be divided into sections, precede the more special articles."

Government Botanist, Western Australia.—We learn with regret of the abolition by the Government of Western Australia of the post of Government Botanist in the Colony held by Mr. A. Morrison.

Index to Kew Bulletin.—An index to the *Bulletin* from its inception in 1887 to the end of the present volume is in course of preparation. This is being issued as an additional appendix (Appendix V.) to the volume for 1906, with the object of enabling those who file the *Bulletin* to bind the general Index with the current volume, or to bind it separately, as may suit their convenience.

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